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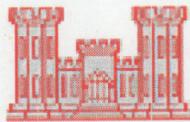
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REPORT
CONTAMINATION INVESTIGATION

**HYDRANT FUEL SYSTEM
NELLIS AIR FORCE BASE**

NEVADA



Prepared by

**U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT**

January 2004

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Contamination Investigation Report

Sub-Surface Soil Sampling in the Vicinity of Proposed Hydrant Fuel System Nellis Air Force Base, Nevada

1.0 BACKGROUND

Design work for the new hydrant fuel system at Nellis AFB is being performed by the Omaha District, US Army Corps of Engineers (USACE). As part of the design effort, Omaha District was tasked with environmental sampling and analysis of soils in the vicinity of the proposed new fueling system to determine if contamination is present in sufficient quantities that would significantly impact the construction of the project.

Several contaminant releases to the environment have occurred at Nellis AFB and groundwater contamination is known to exist in the vicinity of the Hydrant Fuel System project area. Prior to this sampling effort, a preliminary review of available/existing information was performed to evaluate potential construction impacts and to help select soil sampling locations. Specifically, the Tracer Leak Test Report for the 2003 annual testing, the Geotechnical Report prepared for this project, and some ERP data provided by the Air Force and a USACE ERP contractor were reviewed. The following summarizes the findings from this review.

- A. Tracer Leak Test Report for the 2003 annual testing.
 - Summary of review:
 - a. Sampling was performed in April 2003.
 - b. Appears to be only 4 detections in project area and all were below 1.0 mg/L
 - c. The test results were reported as "Passed".
 - Conclusion: Tracer test data suggests no significant leaks or contamination along pipeline alignment in the project area.

- B. Geotechnical Report. The report was briefly reviewed, primarily for any mention of evidence of contamination.
 - Summary of review:
 - a. Investigation consisted of 16 borings, 2 to 20 feet deep.
 - b. No groundwater was encountered.
 - c. Several borings had to be hand augered due to utilities.
 - d. Soils consist primarily of clayey and silty sand with some caliche and cemented zones.
 - e. No evidence of contamination was reported on the drill logs or in the report.
 - Conclusion: The Geotechnical report provides no evidence for any significant subsurface contamination.

- C. ERP data in the vicinity of the project.

- Summary of review:
 - a. There are 3 ERP Sites in the vicinity: ST-27, ST-28, & SS-46 (Figure 1).
 - b. There are a number of monitoring wells in the project area.
 - c. Wells are typically fairly deep (total depth greater than 80 feet with top of screen set at 55 feet or deeper).
 - d. Groundwater is contaminated by TCE, BTEX, MTBE (Figure 2).
 - e. Depth to water is in excess of 50 feet (reported on July/Aug. 2003 Groundwater Sample Field Data Sheets).
 - f. Minimal soil analytical data was provided or located during this review. Results from soil sampling at the former Test Cell Area (FTCA) in August 2002 reported no petroleum hydrocarbon impacted soil was encountered.
 - g. There are no known shallow sources of contamination in the project area.
 - h. Possible sources of shallow soil contamination in the project area could be the Propulsion Maintenance Facility, the FTCA, and the Hush Houses.
- Conclusions:
 - a. Due to the depth to groundwater, the groundwater contamination in the area should not be a factor or impact construction.
 - b. The presence or absence of soil contamination could not be confirmed.

The above review provided little information to aid in the selection of soil sampling locations for this investigation. As a result, the locations selected for this investigation were essentially simply spatially spaced throughout the project area to assure there is no significant soil contamination. NS03-01 through NS03-03 were located along the existing fuel line to check for possible contamination that may have been missed by the Tracer testing. NS03-04 through NS03-06 were located to check the soil in the vicinity of the new POL Facility. NS03-07 through NS03-09 were located along the alignment of the new hydrant loop.

1.1 Objective

The objective of this site investigation was to determine if petroleum hydrocarbon and/or VOC contamination exists in sub-surface soils underlying the proposed project boundaries (see Appendix A), which may necessitate special soil excavating (for worker health and safety) and handling/disposal procedures and conditions that will be required during construction.

1.2 Investigation Location

The field investigation described in this report was conducted along the alignment of the new hydrant fuel system. Refer to Appendix A for a site map.

2.0 FIELD INVESTIGATION SUMMARY

An Omaha District drill crew conducted the contamination investigation for the Hydrant Fuel System at Nellis AFB on 11 to 13 December 2003. The investigation originally consisted of nine (9) soil sampling borings, numbered sequentially NS03-01 through NS03-09. However, location

NS03-02 was not drilled because the location was not accessible to the drilling equipment. An alternative location was considered, but the time required to get the utilities cleared and obtain a digging permit made it infeasible to accomplish and stay within schedule and budget.

Sub-surface soil samples were collected for headspace screening and laboratory analysis using a Gus Pech 1300C drill rig equipped with 4½-inch inside diameter (ID) hollow-stem augers. The original plan was to collect the soil samples using a 3-inch diameter spilt spoon sampler, following ASTM standard penetration test (SPT) methods. However, split spoon refusal on a caliche layer in the first boring drilled (NS03-03) necessitated a change in sampling equipment and all samples were collected using a 5-foot long continuous sampler.

Eight (8) environmental sampling locations were selected for placement over the project site based on the planned layout of the hydrant fuel system. These borehole locations were marked in the field using spray paint to assist in underground utility location work. A Nellis AFB digging permit was obtained prior to conducting fieldwork.

Collected soil samples have been analyzed for gasoline, diesel, and VOCs using the following laboratory methods: TPH-DRO by method 8015 and VOC/TPH-GRO by SW846 method 8260. The samples were analyzed by the USACE Environmental Chemistry Branch Laboratory in Omaha, NE.

3.0 DESCRIPTION OF INVESTIGATION

3.1 Concrete Coring (borings NS03-7, 8, & 9)

Pavement coring was performed using a diamond core barrel. The pavement was patched using a high strength (5,000 psi) concrete mix. The measured thickness varied between 10 inches in NS03-8 to 1.5 feet in NS03-9.

3.2 Sampling Procedures

The soil sampling for this investigation was performed by advancing the continuous sampler past the pre-determined sample depths. Upon retrieval of the continuous sampler at the surface, a portion of the sample was used for headspace screening (paragraph 3.4) and a portion was collected and prepared for laboratory analysis (paragraph 3.3).

3.3 Environmental Soil Sampling

Prior to collecting samples, the continuous sampler was cleaned to eliminate any possible cross contamination as described in Section 3.7 -"Decontamination". Soil samples were acquired from 8 test holes. Sample intervals for headspace screening and environmental soil analysis at each borehole were from 4 – 6 feet and 8 – 10 feet below the pavement or ground surface. The original sampling plan specified that all the samples from the 4 – 6 foot interval be submitted for laboratory chemical analyses unless the sample from the 8 – 10 foot interval had a headspace reading greater than the 4 – 6 foot sample. The deeper sample was to be submitted for lab analyses only if the headspace PID measurement was higher than the shallower sample. Since all headspace measurements were 0.0, none of the 8 – 10 foot samples were submitted to the lab.

Each soil sample consisted of four 4-ounce jars. Two jars were collected for the VOC/TPH-GRO analyses and two for percent solids and TPH-DRO analyses.

After the continuous sampler was retrieved, it was opened and immediately scanned by sight and with a PID for signs of possible fuel contamination.

After PID scanning, the environmental samples for VOC analysis were immediately placed in the 4-ounce jars, capped securely, then placed in iced shipping coolers. Then the samples for the remaining analyses and headspace screening were collected. The VOC samples that were not submitted to the lab (i.e. 8 – 10') were later discarded.

The lab results and Chemical Quality Assurance Report for the soil analyses may be found in Appendix D.

3.4 Headspace Screening Procedures

The soil samples were screened for volatile organic compounds in the field at the time of sample collection. Field screening was performed using a Photovac 2020 photo-ionization detector (PID). The field screening was performed in accordance with the following procedures.

- Immediately upon opening the split-spoon and after collecting the VOC sample, a representative portion of the sample was collected and placed in a new, clean, plastic sandwich bag placed inside a jar. Readings were periodically taken inside empty bags to ensure no external contamination was being introduced.
- The jar was then sealed with at least one continuous sheet of aluminum foil, using the jar lid to secure the foil.
- The jar was then vigorously agitated for at least fifteen seconds and then allowed a minimum of ten minutes for the sample to adequately volatilize.
- After re-shaking the jar, the lid was removed and the vapor sampling probe was quickly inserted through the aluminum foil. The maximum meter response (within first two to five seconds) was recorded.
- The headspace screening data was recorded on the Drilling Log.
- The screening instrument was calibrated using 100 ppm isobutylene span gas at the start of each workday and periodically throughout the day as determined appropriate by the geologist in the field.

3.5 Site Conditions

3.5.1 Significant Environmental Observations

Sample Identification Numbers and depths, date sampled, and headspace results are shown on Table 1. The sampled borehole locations are shown in Appendix A. Sample Description Logs are included in Appendix C. Chain of custody information can be viewed in Appendix B. The sample numbers consist of the boring number followed by the depth. For example: the 8 to 10-foot deep sample from boring NS03-08 is NS03-08-10. The 4 to 6-foot sample is NS03-08-06.

TABLE 1 - Environmental Sampling Information

Sample ID.	Date	Headspace Results (ppm)	Lab*
NS03-01-06	10/13/03	0.0	X
NS03-01-10	10/13/03	0.0	
NS03-02-06	Not Sampled		
NS03-02-10	Not Sampled		
NS03-03-06	12/12/03	0.0	X
NS03-03-10	12/12/03	0.0	
NS03-04-06	12/13/03	0.0	X
NS03-04-10	12/13/03	0.0	
NS03-05-06	12/13/03	0.0	X
NS03-05-10	12/13/03	0.0	
NS03-06-06	12/13/03	0.0	X
NS03-06-10	12/13/03	0.0	
NS03-07-06	12/12/03	0.0	X
NS03-07-10	12/12/03	0.0	
NS03-08-06	12/12/03	0.0	X
NS03-08-10	12/12/03	0.0	
NS03-09-06	12/12/03	0.0	X
NS03-09-10	12/12/03	0.0	

- “X” indicates sample was submitted to laboratory for chemical analyses.

As can be seen from the table above all headspace measurements were zero. The headspace screening results suggests there is no widespread contamination in the shallow soils (0 – 10 ft.) underlying the project area.

A total of eight (8) samples were sent to the lab for chemical analyses. All samples were non-detect for VOC, GRO and DRO except NS03-09-06, which was reported with 1.8 J ug/l toluene. The results of the lab testing are presented in Appendix D. The lab results further suggest that significant soil contamination does not appear to be present in the project area.

3.5.2 Site Geology

The subsurface material encountered during this investigation consists primarily of alternating layers of clay and silt with varying amounts of fine sand and caliche. Refer to the Sample Description Logs in Appendix C for more detailed descriptions of the subsurface materials encountered during this investigation.

3.5.3 Ground Water

Ground water was not encountered in any of the borings.

3.6 Air Monitoring

Air monitoring was conducted periodically for worker health and safety. A PID was used each day to measure total organic vapors near the breathing zone, emanating from each open borehole. The PID was calibrated with 100 parts per million (PPM) isobutylene at the start of each work day and periodically during the day. No significant organic vapors presenting a health and safety concern were reported over any borehole during this field investigation.

3.7 Decontamination

The drilling equipment (augers) was decontaminated prior to drilling and between each boring by high-pressure hot water cleaning. The continuous sampler was hand washed using a liquinox and water solution, tap water rinse, and a distilled water final rinse between each sample depth and sample borehole.

3.8 Investigation Derived Waste Management and Borehole Closure

The only IDW produced were the drill cuttings. Since no contaminated soil was detected by the headspace screening methods the cuttings were placed back in the boreholes. The borings were completely backfilled with cuttings, requiring no other backfilling materials other than the pavement patch as discussed in 3.1.

4.0 PACKAGING AND SHIPMENT

Following proper collection and labeling, the sample jars were placed in plastic bubble wrap, sealed in plastic baggies, and placed on ice in a cooler. Each cooler was filled with double-bagged cubed ice to cool the samples to 4 degrees centigrade. The completed chain of custody (COC) form was placed in a Ziploc bag and taped to the inside of each cooler lid. Custody seals were numbered, dated, signed, and affixed to the outside of each cooler. The seals were placed across the lid opening so that the coolers could not be opened without breaking the seals. Finally, the coolers were sealed with fiber strapping tape. The coolers were shipped via FedEx to the Environmental Chemistry Branch Lab at 420 S. 18th Street, Omaha, NE. Due to the short (2 day) duration on the sampling effort, all samples were shipped at the completion of sampling on the second day. Being shipped on a Saturday, the samples arrived at the lab on Monday (12/15/03).

5.0 PROTECTION LEVEL

Soil sampling was conducted under worker protection level D. Protection Level D consisted of appropriate fieldwork clothing, hardhat, earplugs, eye protection, Nitrile gloves, and steel toed leather boots.

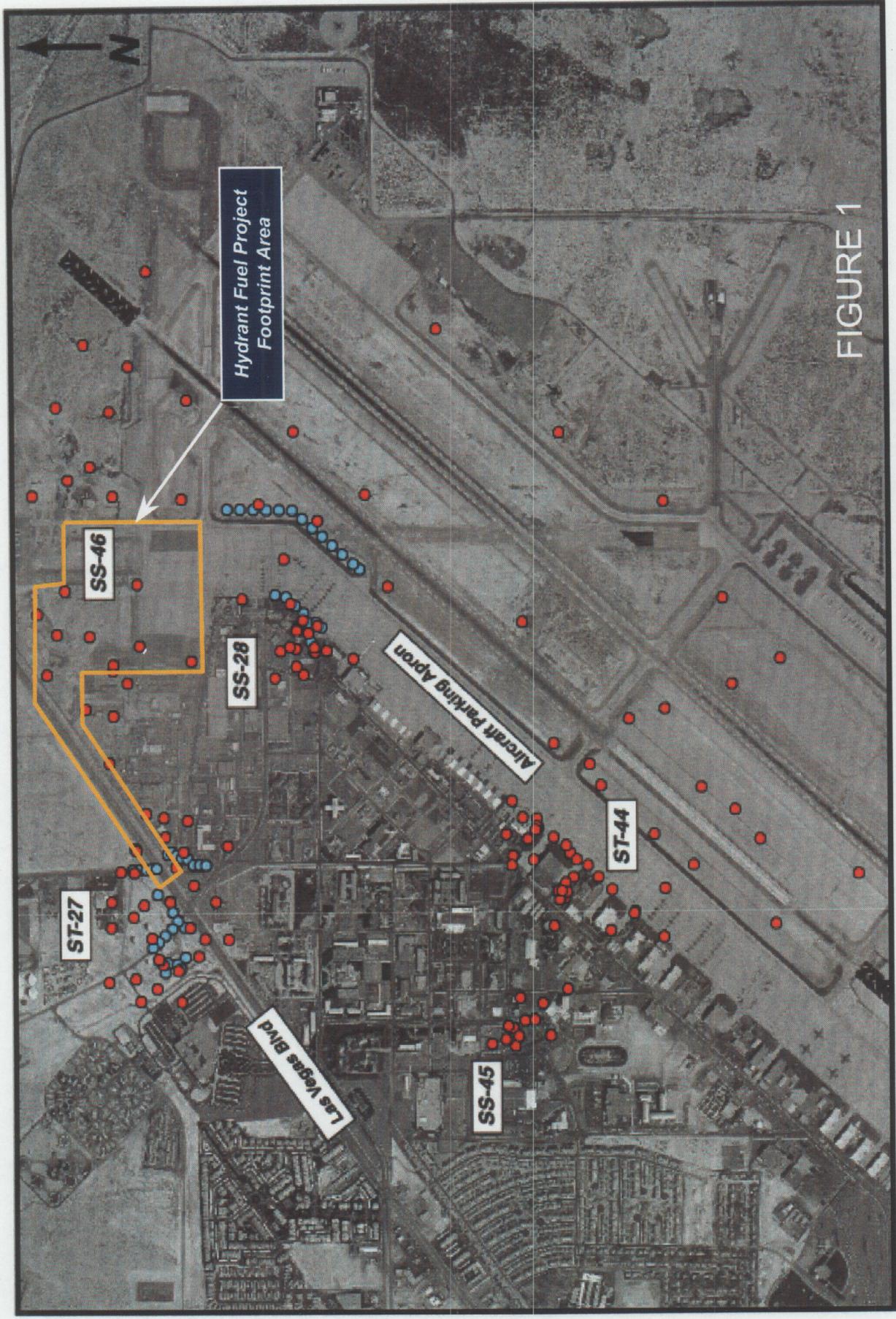
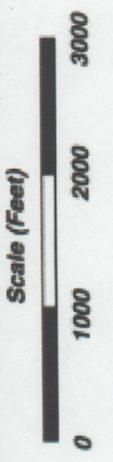


FIGURE 1

- Monitoring Well
- Extraction Well

Overview of Nellis AFB ERP Site Locations



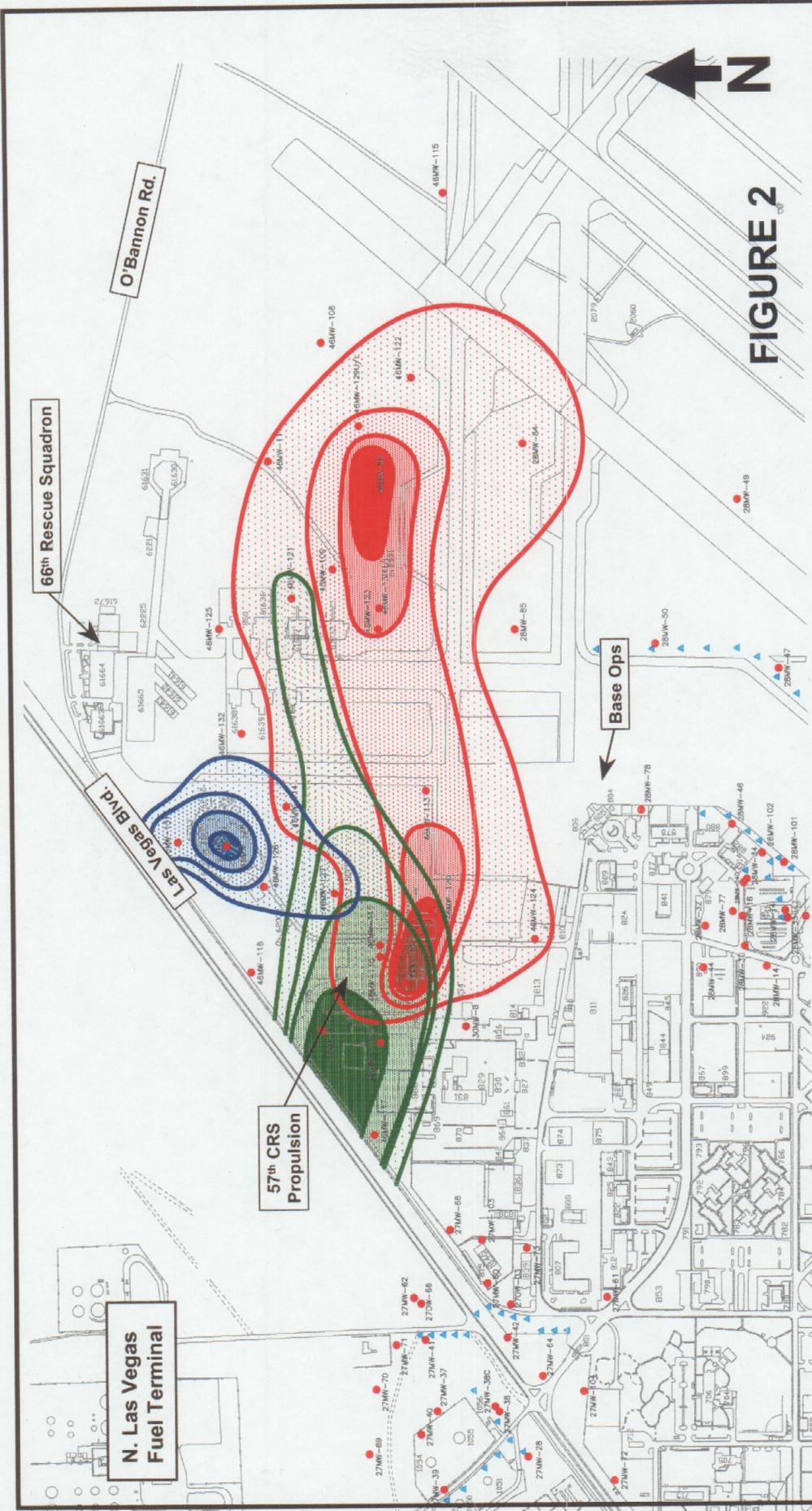


FIGURE 2

Site SS-46
Trichloroethene (TCE), Benzene, and Methyl Tertiary Butyl Ether (MTBE) Groundwater Contaminant Plumes
 October/November 2002

Groundwater Monitoring Well	Groundwater Contaminant Plumes
● Groundwater Monitoring Well	■ TCE Impacted Groundwater
▲ Groundwater Extraction Well	■ Benzene Impacted Groundwater
	■ MTBE Impacted Groundwater

0 500 1000 1500
 Scale (feet)

APPENDIX A

APPENDIX A
Quantities Estimate and Sampling Location Map

The purpose of this investigation was to assess the potential for encountering contaminated soil during installation of the hydrant fuel system, and to estimate the volume of contaminated soil likely to require special handling or disposal procedures during construction. Data referenced for determining the potential included existing TRACER, geotechnical and ERP reports, as well as subsurface sampling and analysis performed during the field phase of this investigation.

No indication of shallow soil contamination was found in the previous reports, and no indication was found at the sampled locations. Although the volume of soil sampled as compared to the total volume of soil to be excavated for the system is minute, the results are believed to be representative of general conditions at the project site. Based on these data the potential for encountering contamination during construction is considered to be low.

APPENDIX B

APPENDIX C

HTRW DRILLING LOG

DISTRICT

NWO

HOLE NUMBER
NS03-1

SHEET 1 OF 1 SHEETS

1 COMPANY NAME

CENWO-ED-66

2 DRILL SUBCONTRACTOR

NA

3 PROJECT

Hydrot Fuel System Cont. Investigation

4 LOCATION

Nellis AFB Las Vegas NV

5 NAME OF DRILLER

Richard Canoll

6 MANUFACTURER'S DESIGNATION OF DRILL

Gus Pech 1300C

7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT

4 1/4" HSA

3" Split Spoon

8 HOLE LOCATION

9 SURFACE ELEVATION

10. DATE STARTED

12/13/03

11. DATE COMPLETED

12/13/03

12. OVERBURDEN THICKNESS

≥ 10.0'

15. DEPTH GROUNDWATER ENCOUNTERED

NA

13. DEPTH DRILLED INTO ROCK

NA

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED

NA

14. TOTAL DEPTH OF HOLE

10.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

NA

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

NA

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

21. TOTAL CORE RECOVERY %

23. SIGNATURE OF INSPECTOR

Wagon

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT

Hydrot Fuel System Contamination Investigation

HOLE NO.

NS03-1

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER

NS03-1

PROJECT

Hydrant Fuel System Invest.

INSPECTOR

Wojan

SHEET

SHEETS

2 OF

ELEV. (d)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (e)	GEOTECH SAMPLE OR CORE BOX NO. (a)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0		Calibrated PID @ 10.5 on 12/13/03				Begin drilling @ 1030 on 12/13/03. Using 4 1/4" HSA 3" Split Spacers.
	1	Sandy Silt (MH-ML): no to low plasticity, dry, white, silt w/ v. fine sand. Calc cement reacts vis. to HCL.	Background 0.0 ppm				Using Cent. Sampler.
	2						
	3						
	4					4.0'	
	5	Clay (CL): med to high plasticity, damp, light brown clay w/ silt. 1.0 ft thick. Within sandy silt.	Leadspace: 0.0 ppm	NS03-1-04	4 - Sand.		Time: 1030 Recovery: 3.5' Blowcounts: NA 3 - 7.0 FF Run
	6	Getting really hard here. really well cemented.				4.0'	
	7	Back into Clay (CL): Same as above. moist.	Background 0.0 ppm				
	8					8.0	
	9		Leadspace 0.0 ppm				Time: 1048 Recovery: Blowcounts: Run 7-10.0 FF
	10	Caliche (Sandy Silt) Same as above.	Except very well cemented.				

PROJECT

Hydrant Fuel System Contamination Investigation

HOLE NO.

NS03-1

HTRW DRILLING LOG (CONTINUATION SHEET)

PROJECT
Hydrant Fuel System Invest.

INSPECTOR
Wozniak

HOLE NUMBER
NS03-3

SHEET 2 OF SHEETS

ELEV. (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEO TECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOG COUNT (g)	REMARKS (h)
	0		Calibrated PID @ 0.815 on 12/12/03				Beginning @ 0830 on 12/12/03. Using 4 1/4" HSA 3" Split Spacers.
	1	Limestone: no plasticity, v. fine grained, silty, dry, white in color, reacts vigorously to HCL. very hard.					
	2		Background 0.0 ppm				Cuttings are a fine powder. Reacts vigorously to HCL.
	3	last foot of run got very hard.					
	4					4.0'	Did not make any headway.
	5		Headspace: 0.0 ppm		send in 4 spcs for VOCS and TPH-6 PD and TPHORO NS03-3-06	60	Time: 0834 Recovery: Blowcounts: Going to try to collect samples. Making Run 4-7 Time 0858 Rec: 3 ft.
	6						
	7		Background 0.0 ppm				
	8					8.0	
	9	Same as above, alternates hard and soft thru both barrels	Headspace 0.0 ppm				Time: 0822 Recovery: 1.0 ft Blowcounts: NA Using Cent. Sorel Rec: 1.0 ft 7-10.0 ft.
	10	Bottom of Hole					

PROJECT
Hydrant Fuel System Contamination Investigation

HOLE NO.
NS03-3

HTRW DRILLING LOG		DISTRICT		NWO		HOLE NUMBER		NS03-4	
1 COMPANY NAME		CENWO-ED-66		2 DRILL SUBCONTRACTOR		NA		SHEET SHEETS	
3 PROJECT		Hydant Fuel System Cont. Investigation		4 LOCATION		Nellis AFB Las Vegas NV		1 OF	
5 NAME OF DRILLER		Richard Canoll		6 MANUFACTURER'S DESIGNATION OF DRILL		Gus Peck 1300C			
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT		4 1/2" HSA 3" Split Screen		8 HOLE LOCATION					
12 OVERBURDEN THICKNESS		≥ 10.0'		10. DATE STARTED		12/12/03		11. DATE COMPLETED	
13. DEPTH DRILLED INTO ROCK		NA		15. DEPTH GROUNDWATER ENCOUNTERED		NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE		10.0'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)		NA		18. TOTAL NUMBER OF CORE BOXES	
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED		18. TOTAL NUMBER OF CORE BOXES		NA	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		METALS		OTHER (SPECIFY)		OTHER (SPECIFY)	
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL		OTHER (SPECIFY)		21. TOTAL CORE RECOVERY %	
LOCATION SKETCH/COMMENTS						23. SIGNATURE OF INSPECTOR		Wagon	
						SCALE:			
PROJECT		Hydant Fuel System Contamination Investigation		HOLE NO.		NS03-4			

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER
NS03-4

PROJECT
Hydant Fuel System Investig.

INSPECTOR
Wagon

SHEET 2 OF SHEETS

ELEV. (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0		Calibrated PID @ 0825 0935 on 12/13/03				Begin drilling @ 0825 0935 12/13/03. Using 4 1/2" HSA 3" Split Spacers.
	1	Sandy silt (M+ML): dry, no no plasticity, white, silt w/ very fine sand, CaCO ₃ cement.					
	2		Background 0.0ppm				Using Continuous Sampler.
	3						
	4					4.0'	
	5	Same as above. very chunky & hard and soft stuff interbedded.	Headspace 0.0ppm		NS03-4-06 4 Sam.		Time: 0945 Recovery: 3.0 Blowcounts: NA Run 4-7 ft.
	6						
	7		Background 0.0ppm			4.0'	
	8					8.0	
	9	Same as above. Last 1 foot. Clay rich (CL): Clay (CL): med to high plasticity, damp, light brown, slay w/ some silt. little or no sand.	Headspace 0.0ppm				Time: 0955 Recovery: 3.0 ft Blowcounts: NA
	10						

PROJECT
Hydant Fuel System Contamination Investigation

HOLE NO.
NS03-4

HTRW DRILLING LOG

DISTRICT **NWO**

HOLE NUMBER
NS03-5
SHEET **1** OF **1**

1 COMPANY NAME
CENWO-ED-66

2 DRILL SUBCONTRACTOR
NA

3 PROJECT
Hydrot Fuel System Cont. Investigation

4 LOCATION
Wells AFB Las Vegas NV

5 NAME OF DRILLER
Richard Canoll

6 MANUFACTURER'S DESIGNATION OF DRILL
Cous Peck 1300C

7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT
**4 1/4" HSA
3" Split Spoon**

8 HOLE LOCATION

9 SURFACE ELEVATION

12 OVERBURDEN THICKNESS
≥ 10.0'

10. DATE STARTED
12/13/03

11. DATE COMPLETED
12-13-03

13. DEPTH DRILLED INTO ROCK
NA

15. DEPTH GROUNDWATER ENCOUNTERED
NA

14. TOTAL DEPTH OF HOLE
10.0'

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
NA

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)
NA

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

18. TOTAL NUMBER OF CORE BOXES
NA

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE RECOVERY %

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR
Wagon

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT
Hydrot Fuel System Contamination Investigation

HOLE NO
NS03-5

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER
NS03-5
SHEET 2 OF SHEETS

PROJECT: **Hydant Fuel System Invest.**

INSPECTOR: **Wojan**

ELEV. (ft)	DEPTH (ft)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	BLOW COUNT (G)	REMARKS (H)
	0		Calibrated PID @ 0825 on 12/13/03				Beginning @ 0825 on 12/13/03. Using 4 1/2" NSA 3" Split Spacers.
	1	Sandy Silt (MH): no plasticity (?), dry, white, v. fine sand and mostly silt. CaCO ₃ and hard and soft zones.	Background 0.0 rpm				Using Continuous Sampler.
	2						
	3						
	4					4.0'	
	5		Headgear		NS03-05-06		Time: 0830 Recovery: 8" Blowcounts: NA Made Run from 3-7 ft. Cattfish hits what felt like a void at approx. 5 1/2 = 6 ft.
	6	Got very hard under void area. at end of run. top of calc. zone.				4.0'	
	7		Background 0.0 rpm				
	8	Same as above.				8.0	
	9	Clay (CL): w/ clay rock zone here. light brown, clay, clay w/ some silt. red to high plasticity some as above (MH).	Only 1/2' thick 9-9.5 ft.				Time: 0840 Recovery: 2.0 Blowcounts: NA
	10						Bottom of Hole 10.0'

PROJECT: **Hydant Fuel System Contamination Investigation**

HOLE NO. **NS03-5**

HTRW DRILLING LOG

DISTRICT

NWO

HOLE NUMBER
NB03-6

1 COMPANY NAME

CEW-ED-66

2 DRILL SUBCONTRACTOR

NA

SHEET 1 OF 3 SHEETS

3 PROJECT

Hydrant Fuel System Cont. Investigation

4 LOCATION

Nellis AFB Las Vegas NV

5 NAME OF DRILLER

Richard Canoll

6 MANUFACTURER'S DESIGNATION OF DRILL

Cous Peck 1300C

7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT

4 1/4" HSA
3" Split Spoon

8 HOLE LOCATION

9 SURFACE ELEVATION

12 OVERBURDEN THICKNESS

≥ 10.0'

10. DATE STARTED

12/13/03

11. DATE COMPLETED

12/13/03

13. DEPTH DRILLED INTO ROCK

NA

15. DEPTH GROUNDWATER ENCOUNTERED

NA

14. TOTAL DEPTH OF HOLE

10.0'

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED

NA

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

NA

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

NA

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

21. SIGNATURE OF INSPECTOR

Wagon

21. TOTAL CORE RECOVERY %

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT

Hydrant Fuel System Contamination Investigation

HOLE NO.

NB03-6

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER
NS03-6
SHEET
2 OF
SHEETS

PROJECT
Hydrot Fuel System Invest.

INSPECTOR
Wagon

ELEV. (c)	DEPTH (d)	DESCRIPTION OF MATERIALS (e)	FIELD SCREENING RESULTS (f)	GEOTECH SAMPLE OR CORE BOX NO. (g)	ANALYTICAL SAMPLE NO. (h)	BLOW COUNT (i)	REMARKS (j)	
0	0	Steady silt (MH-ML): no to low plasticity, dry, white silt w/ some v. fine sand.	Calibrated PID @ 0901 on 12/13/03				Begin drilling @ 0901 on 12/13/03. Using 4 1/4" MSA 3" Split Spacers. Using Cent. Samples.	
1	1							Background 0.0ppm
2	2							
3	3							
4	4	Some as above.				4.0'		
5	5	Clay rich seam toward bottom of run. 1-2" thick. light brown moist.	Headspace: 0.0ppm	NS03-6-06 4-5 core.			Time: 0910 Recovery: 3.0' Blowcounts: N/A 3-7.0 Ft.	
6	6							
7	7		Background 0.0ppm				4.0'	
8	8	Same as above.					8.0'	
9	9	Very hard solid Caliche Zone. Very well cemented. w/ small little voids.	Headspace: 0.0ppm				Time: 0925 Recovery: 3.0ft. Blowcounts: N/A 7-10.0 ft.	
10	10							
	10	Very thin clay seam at bottom 1-2" thick.						

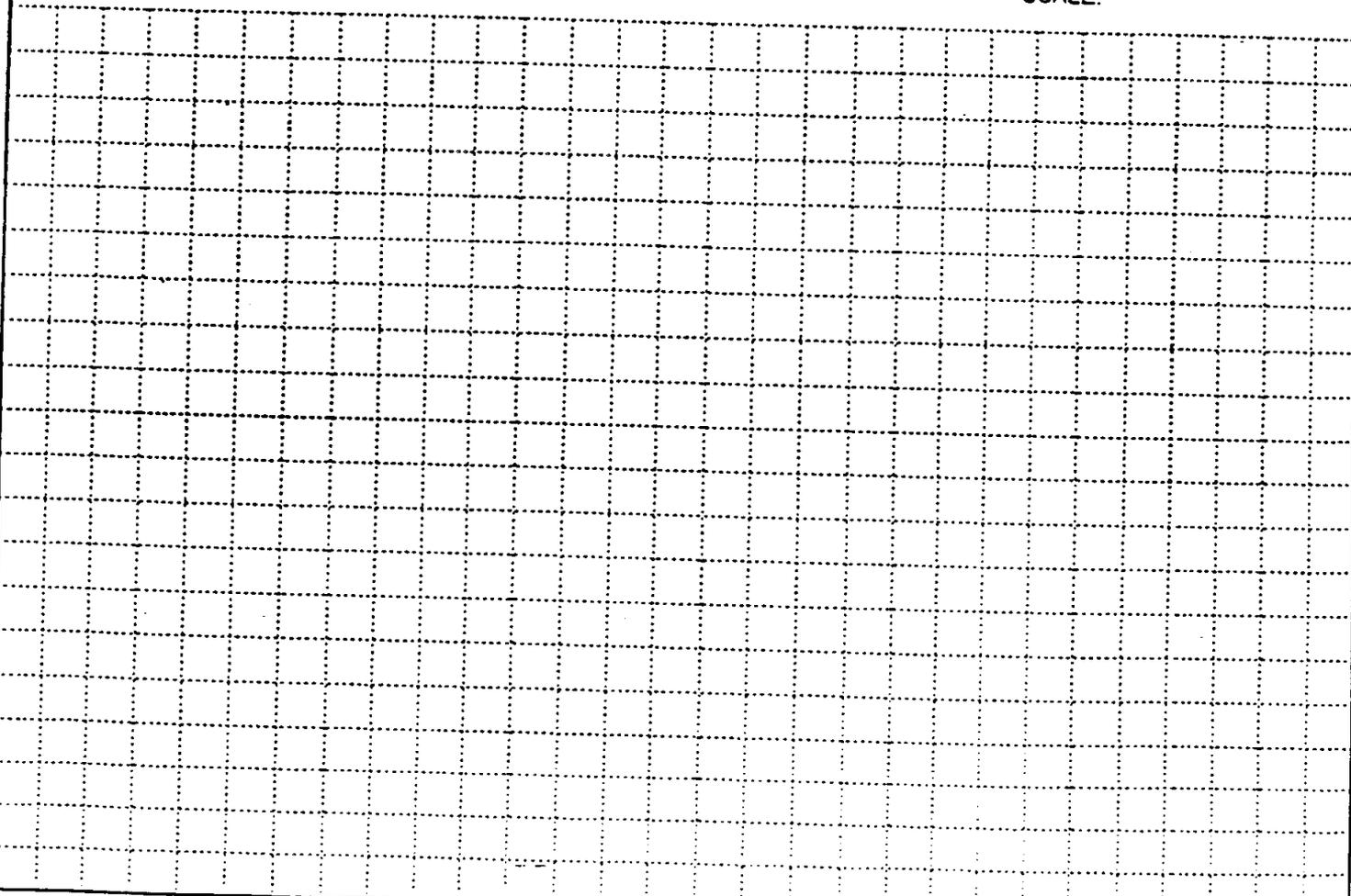
PROJECT
Hydrot Fuel System Contamination Investigation

HOLE NO.
NS03-6

HTRW DRILLING LOG		DISTRICT NWO		HOLE NUMBER NS03-7	
1 COMPANY NAME CENWO-ED-66		2 DRILL SUBCONTRACTOR NA		SHEET 1 OF 7	
3 PROJECT Hydant Fuel System Cont. Investigation			4 LOCATION Nellis AFB Las Vegas NV		
5 NAME OF DRILLER Richard Carroll			6 MANUFACTURER'S DESIGNATION OF DRILL Cous Peck 1300C		
7 SIZE AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" HSA 3" Split Spoon		8 HOLE LOCATION		9 SURFACE ELEVATION	
12 OVERBURDEN THICKNESS ≥ 10.0'		10. DATE STARTED 12-12-03		11. DATE COMPLETED 12-12-03	
13. DEPTH DRILLED INTO ROCK NA		15. DEPTH GROUNDWATER ENCOUNTERED NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
14. TOTAL DEPTH OF HOLE 10.0'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES NA		20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY %	
		VOC		METALS	
		OTHER (SPECIFY)		OTHER (SPECIFY)	
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL	
		OTHER (SPECIFY)		23. SIGNATURE OF INSPECTOR Wagon	

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT Hydant Fuel System Contamination Investigation	HOLE NO. NS03-7
--	---------------------------

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER
NS03-7

PROJECT
Hydant Fuel System Invest.

INSPECTOR
Wojan

SHEET
2 OF
SHEETS

ELEV. (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEO TECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0		Calibrated PID @ 1440 on 12/12/03				Begin drilling @ 1445 on 12/12/03. Using 4 1/4" HSA 3" Split Spans.
	1	Concrete.					Using Continuous Samplers instead.
	2	Silty Clay (CL) med plasticity, damp, gray to white, v. fine silt and clay. CaCO ₃ cement.	Headspace 0.0ppm				
	3	Caliche zones. Silt 10-20%.					
	4					4.0'	
	5	Sand.	Background 0.0		NS03-07-06 4-Sans.		Time: 1501 Recovery: 2.0' Blowcounts: NA
	6					4.0'	
	7						
	8					8.0	
	9	Same as above. last foot was fairly clay rich and moist. 8-9 ft was hard.	Headspace 0.0ppm				Time: 1512 Recovery: 2.0' Blowcounts: NA
	10	Bottom of Hole 10.0 ft.					

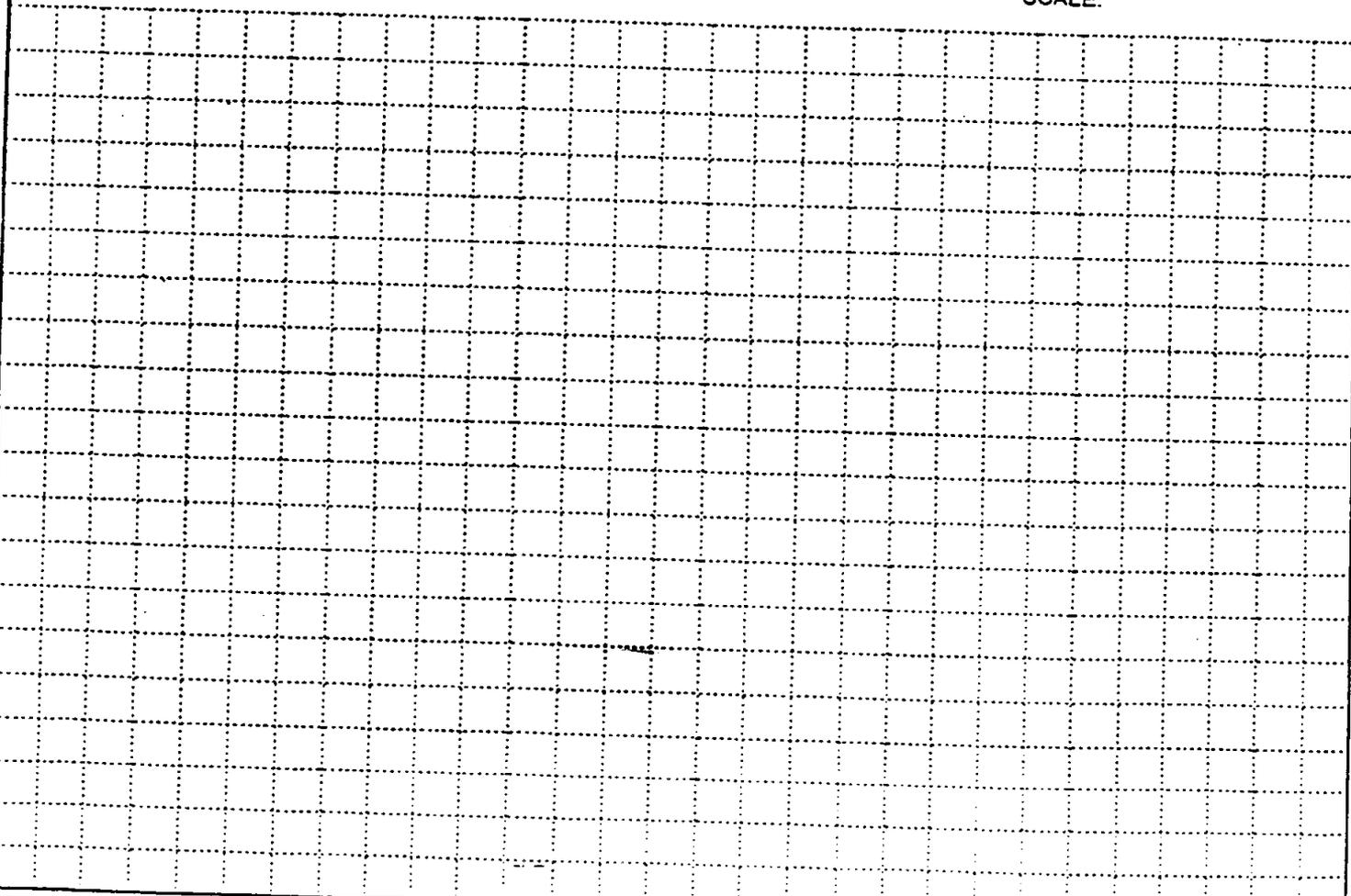
PROJECT
Hydant Fuel System Contamination Investigation

HOLE NO.
NS03-7

HTRW DRILLING LOG		DISTRICT NWO		HOLE NUMBER NS03-8	
1. COMPANY NAME CENWO-ED-66		2. DRILL SUBCONTRACTOR NA		SHEET SHEETS 1 of 2	
3. PROJECT Hydrot Fuel System Cont. Investigation			4. LOCATION Nellis AFB Las Vegas NV		
5. NAME OF DRILLER Richard Carroll			6. MANUFACTURER'S DESIGNATION OF DRILL Cous Peck 1300C		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" HSA 3" Split Spoon		8. HOLE LOCATION		9. SURFACE ELEVATION	
12. OVERBURDEN THICKNESS ≥ 10.0'		10. DATE STARTED 12/12/03		11. DATE COMPLETED 12/12/03	
13. DEPTH DRILLED INTO ROCK NA		15. DEPTH GROUNDWATER ENCOUNTERED NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
14. TOTAL DEPTH OF HOLE 10.0'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		METALS	
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL	
				19. TOTAL NUMBER OF CORE BOXES NA	
				21. TOTAL CORE RECOVERY %	
				23. SIGNATURE OF INSPECTOR Wagon	

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT Hydrot Fuel System Contamination Investigation	HOLE NO. NS03-8
--	---------------------------

HTRW DRILLING LOG (CONTINUATION SHEET)

PROJECT
Hydrant Fuel System Investig.

INSPECTOR
Wozniak

HOLE NUMBER
NS03-8

SHEET
2 OF 2

ELEV. (c)	DEPTH (d)	DESCRIPTION OF MATERIALS (e)	FIELD SCREENING RESULTS (g)	GEOTECH SAMPLE OR CORE BOX NO. (h)	ANALYTICAL SAMPLE NO. (i)	B.C. COUNT (j)	REMARKS (k)
0			Calibrated PID @ 1320 on 12/12/03				Begin drilling @ 1325 on 12/12/03. Using 4 1/4" HSA 3" Split Spoon.
	10 inches	Concrete.					
1		Silty Clay (LL): med to low plasticity, dry, white to light brown light brown Reeds Background	0.0ppm				Using Continuous Sampler Caliche TS to hard to spoon.
2		As EtCL. v. normally. White zones are the hard caliche zone for most part.					
3							
4						4.0'	
		light brown zones are clay rich.					
5			Headspace 0.0ppm		NS03-08-06 4-3ars		Time: 1340 Recovery: 1.0ft Blowcounts: NA
6		moist light brown zone at end of run.					
7						4.0'	
		1ft and more Caliche zones w/ softer clay rich zones in between.	Background 0.0ppm				
8						8.0	
9			Headspace				Time: 1350 Recovery: 1.5 Blowcounts: NA
		Getting very hard TS standing up. last 6 inches solid caliche.					
10		Bottom of hole 10.0ft.					

PROJECT
Hydrant Fuel System Contamination Investigation

HOLE NO.
NS03-8

HTRW DRILLING LOG

DISTRICT **NWO**

HOLE NUMBER **N503-9**

SHEET **1** OF **1** SHEETS

1 COMPANY NAME **CENWO-ED-66**

2 DRILL SUBCONTRACTOR **NA**

3 PROJECT **Hydrot Fuel System Cont. Investigation**

4 LOCATION **Nellis AFB Las Vegas NV**

5 NAME OF DRILLER **Richard Canoll**

6 MANUFACTURER'S DESIGNATION OF DRILL **Cous Peck 1300C**

7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT
4 1/4" HSA
3" Split Spoon

8 HOLE LOCATION

9 SURFACE ELEVATION

12 OVERBURDEN THICKNESS **≥ 10.0'**

10. DATE STARTED **12/12/03** 11. DATE COMPLETED **12/12/03**

13. DEPTH DRILLED INTO ROCK **NA**

15. DEPTH GROUNDWATER ENCOUNTERED **NA**

14. TOTAL DEPTH OF HOLE **10.0'**

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED **NA**

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) **NA**

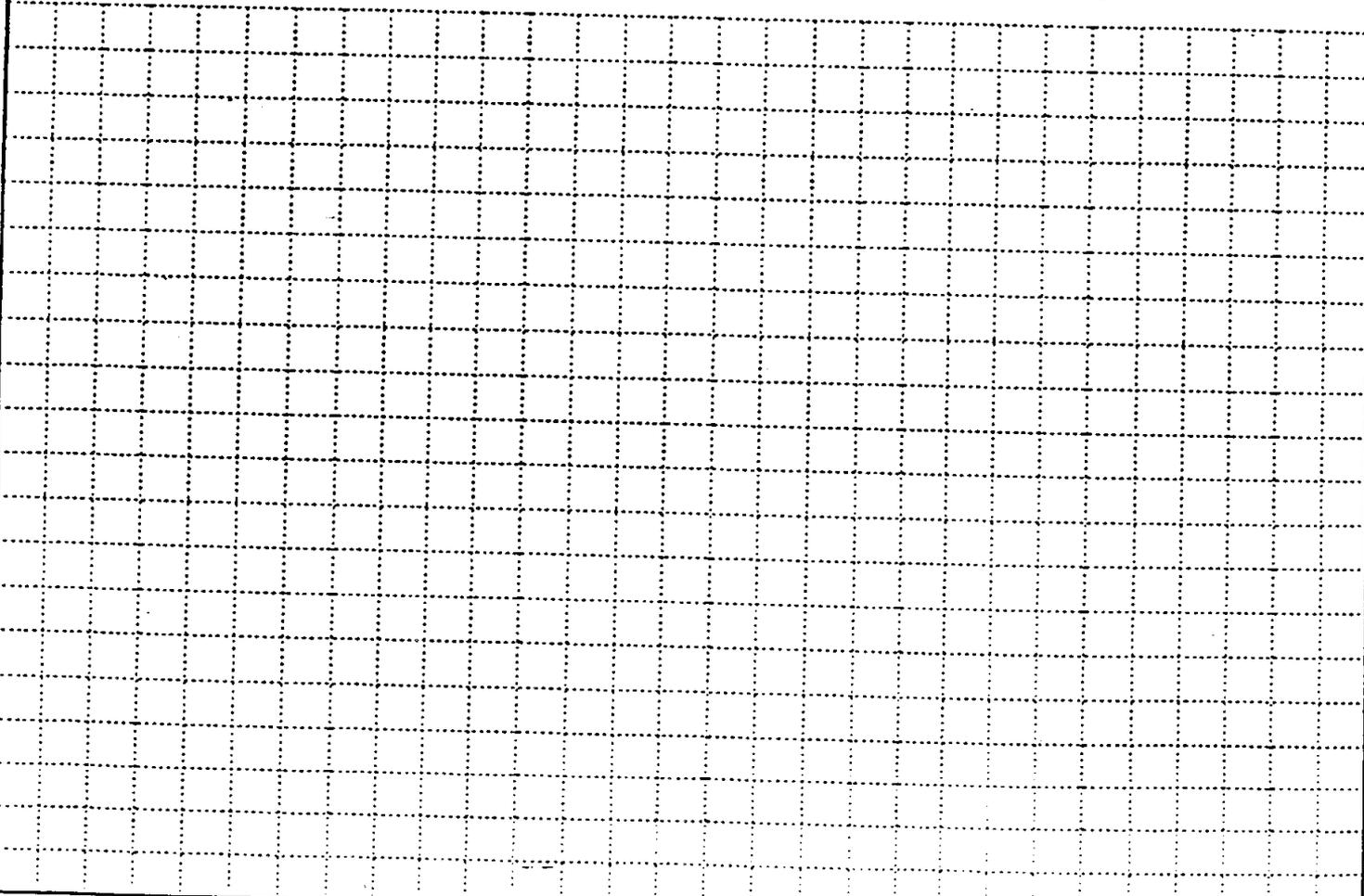
18. GEOTECHNICAL SAMPLES
DISTURBED _____ UNDISTURBED _____ 18. TOTAL NUMBER OF CORE BOXES **NA**

20. SAMPLES FOR CHEMICAL ANALYSIS
VOC _____ METALS _____ OTHER (SPECIFY) _____ OTHER (SPECIFY) _____ OTHER (SPECIFY) _____ 21. TOTAL CORE RECOVERY %

22. DISPOSITION OF HOLE
BACKFILLED _____ MONITORING WELL _____ OTHER (SPECIFY) _____ 21. SIGNATURE OF INSPECTOR **Wagon**

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT **Hydrot Fuel System Contamination Investigation**

HOLE NO. **N503-9**

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER
NS03-9

PROJECT
Hydant Fuel System Invest.

INSPECTOR
Wojan

SHEET 2 OF SHEETS

ELEV. (d)	DEPTH (e)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (g)	GEOTECH SAMPLE OR CORE BOX NO. (h)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (i)	REMARKS (j)
	0	Leaving thru concrete.	Calibrated PID @ 1015 on 12/12/03				Begin drilling @ 1020 on 12/12/03. Using 4 1/2" MSA 3" Split Spacers.
	1	Concrete.					1045 thru concrete.
	2		Background 0.0ppm				
	3						
	4	Clayey silt/silty clay (CL-ML) Calcite: dark, white, no to low plasticity, v. fine grained silt and clay. CaCO ₃ cement. Reacts to HCL. alternating hard and soft zones.	Background 0.0ppm			4.0'	Time: 1055 Recovery: 4.0 Blowcounts: NA Using Cont. sampler
	5		Headspac 0.0ppm		NS03-9-06 4502.		2.5-7ft
	6					4.0'	
	7		Background 0.0ppm				
	8	Same as above.				8.0	
	9		Headspac 0.0ppm				Time: 1110 Recovery: 2.0 Blowcounts: NA 7-10.0 ft.
	10						

PROJECT
Hydant Fuel System Contamination Investigation

HOLE NO.
NS03-9

APPENDIX D

Nellis AFB Hydrant Fuel System
Contaminated Soils Investigation
Sample Collection Dates: 12 – 13 December 2003
Laboratory: Environmental Chemistry Branch Laboratory
LIMS #: 7004

Quality Control Summary Report

The following report is a Level III-type data evaluation/validation report. This was based on the Certificate of Analysis provided by the Environmental Chemistry Branch Laboratory on 12 January 2004.

Sample Condition and Holding Times

Eight samples arrived in good condition at the lab at 4°C except for one Volatile Organic sample which arrived broken. However there was enough sample volume to perform all analyses. All samples were analyzed within holding times. Because the soil samples contained caliche and carbonate minerals, when sodium bisulfate was added to the soil to preserve it, foaming resulted, which could allow volatile contaminants to escape from the sample. Because of this the samples were only mixed with water prior to purging.

Sample Results, Comparability and Completeness

All samples were analyzed by standard methods for comparability: Volatile Organic Compounds (VOC) and Gasoline Range Organics (GRO) by Method SW846 8260B, and for Diesel Range Organics (DRO) by Method SW846 8015B. There was only one detection in sample NS03-09-06, toluene at 1.8 J ug/kg. Detection limits provided adequate sensitivity to determine whether contamination was present in the sample. All analyses were successfully completed.

Representativeness

Field and laboratory quality control procedures prevented cross-contamination of the samples. Method blanks were free of contamination.

Precision and Accuracy

Surrogate spike recovery and matrix spike recovery show whether sample results are accurate given matrix effects. With the exception of the matrix spike and matrix spike duplicate recoveries for dichlorodifluoromethane, acetone, and 2-butanone, which are not expected to be site contaminants, all recoveries were within the ECB and SW 846 acceptance limits. The relative percent difference (RPD) of the spike recoveries is an indicator of field and laboratory precision through comparison of either sample results in the case of field duplicates or spike recovery results. No field duplicates were collected. RPDs of the matrix spike and matrix spike duplicates were all below the ECB lab and SW 846 acceptance range indicating adequate precision.

Data Usability

The sample data is usable to determine that contamination due to release of fuel hydrocarbons does not exist in the sample locations selected. However, due to the limited number of samples collected, and the limited spatial coverage, it cannot be concluded that no contamination is present anywhere in the area of investigation.

DEPARTMENT OF THE ARMY
 CORPS OF ENGINEERS
 ENVIRONMENTAL CHEMISTRY BRANCH
 OMAHA, NEBRASKA 68102

72 JAN 04

Subject: Certificate of Analysis

Project: Nellis AFB - Hydrant Fuel System, AZ

Intended Use: IRP-AF-ACC

Source of Material: _____

Submitted by: Danielle Talkington, CENWO-ED-GC

Date Sampled: 12 - 13 Dec 03 Date Received: 15 Dec 03

Method of Test or Specification: See attached test result sheets

References: Omaha District Request

-- REMARKS --

1. Sample receipt information and analytical data are provided in the following parts of the report.
 - Part A: Sample Receipt Information (1 page)
 - Part B: Chain-of-Custody Information (2 pages)
 - Part C: Analytical Test Results (36 pages)
2. The Test Results are attached; if you have any questions please contact Laura Percifield at (402)444-4313.

Submitted by:



DOUGLAS B. TAGGART
 Chief, Environmental
 Chemistry Branch

RP 1/21/04

Percifield/glm/444-4313

PART A

SAMPLE RECEIPT INFORMATION

Sample Number	Customer Sample ID	Date Sampled	Matrix	ECB # Assigned	Tests Assigned	Test Results Page Number
001	NS03-03-06	12-Dec-03	Soil	M031334-001	TPH	C25
	NS03-03-06	12-Dec-03	Soil	M031334-001	VOA	C1-C2
002	NS03-09-06	12-Dec-03	Soil	M031334-002	TPH	C26
	NS03-09-06	12-Dec-03	Soil	M031334-002	VOA	C3-C4
003	NS03-08-06	12-Dec-03	Soil	M031334-003	TPH	C27
	NS03-08-06	12-Dec-03	Soil	M031334-003	VOA	C5-C6
004	NS03-07-06	12-Dec-03	Soil	M031334-004	TPH	C28
	NS03-07-06	12-Dec-03	Soil	M031334-004	VOA	C7-C8
005	NS03-05-06	13-Dec-03	Soil	M031334-005	TPH	C29
	NS03-05-06	13-Dec-03	Soil	M031334-005	VOA	C9-C10
006	NS03-06-06	13-Dec-03	Soil	M031334-006	TPH	C30
	NS03-06-06	13-Dec-03	Soil	M031334-006	VOA	C11-C12
007	NS03-04-06	13-Dec-03	Soil	M031334-007	TPH	C31
	NS03-04-06	13-Dec-03	Soil	M031334-007	VOA	C13-C14
008	NS03-01-06	13-Dec-03	Soil	M031334-008	TPH	C32
	NS03-01-06	13-Dec-03	Soil	M031334-008	VOA	C15-C16

PART B

CHAIN-OF-CUSTODY INFORMATION

Page No.	Chain-of-Custody No.	Date Signed
B1	14765	13 Dec 03

CHAIN OF CUSTODY RECORD

PROJ. NO. PROJECT NAME

6987a Hydrom / Fuel System

SAMPLERS: (Signature)

W. Johnson

STA. NO. DATE TIME COMP. GRAB STATION LOCATION

NO. OF TAINERS

NO. OF TAINERS
CON.
VOC'S-TPH-GRO
TPH-DRO

REMARKS

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF TAINERS	NO. OF TAINERS	REMARKS
	12/16/03	0905		X	NS03-03-06	4	X	4-402. Jans.
	12/16/11	15		X	NS03-09-06	4	X	4-402. Jans.
	12/16/13	55		X	NS03-08-06	4	X	4-402. Jans.
	12/16/15	15		X	NS03-07-06	4	X	"
	12/16/15	45		X	NS03-05-06	4	X	"
	12/16/13	30		X	NS03-06-06	4	X	"
	12/13/10	00		X	NS03-04-06	4	X	"
	12/13/10	50		X	NS03-01-06	4	X	"

Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received by: (Signature)

W. Johnson 12/13/03 12:35 *W. Johnson*

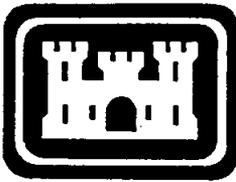
Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received by: (Signature)

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Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received by: (Signature)

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files



COOLER RECEIPT FORM

7004 Environmental Chemistry Branch Laboratory

LIMS # 1987 ECB Cooler # _____ Number of Coolers _____ Contractor Cooler _____

Project: Hydrant fuel system Date received: 12/15/03

USE OTHER SIDE OF THIS FORM TO NOTE DETAILS CONCERNING CHECK-IN PROBLEMS.

A. PRELIMINARY EXAMINATION PHASE: Date cooler opened: 12/15/03 C-of-C Number: 14765
by (print) Shelly Swink (sign) Shelly Swink

- 1. Did cooler come with a shipping slip (air bill, etc.)? YES NO
If YES, enter carrier name & air bill number here: FedEx
- 2. Were custody seals on outside of cooler? YES NO
How many & where: 2/inside seal date: 12/13/03 seal name: Wagner
- 3. Were custody seals unbroken and intact at the date and time of arrival? YES NO
- 4. Did you screen samples for radioactivity using the Geiger Counter? YES NO
- 5. Were custody papers sealed in a plastic bag & taped inside to the lid? YES NO
- 6. Were custody papers filled out in the appropriate place? YES NO
- 7. Did you sign custody papers in the appropriate place? YES NO
- 8. Was project identifiable from custody papers? YES NO
- 9. Type of ice: dry Temperature: 4.0 Date temperature measured: 12/15
- 10. Describe type of packing in cooler: bubble wrap
- 11. Were all bottles sealed in separate plastic bags? YES NO

B. LOG-IN PHASE: Date samples were logged-in: 12/15/03
by (print) Shelly Swink (sign) Shelly Swink

- 12. Did all bottles arrive unbroken & were labels in good condition? YES NO
1 - Van sample 7 arrived broken
- 13. Were all bottle labels complete (ID, date, time, signature, preservative, etc.)? YES NO
- 14. Did all bottle labels agree with custody papers? YES NO
- 15. Were correct containers used for the tests indicated? YES NO
- 16. Were correct preservatives added to samples? YES NO
- 17. Was a sufficient amount of sample sent for tests indicated? YES NO
- 18. Was headspace absent in volatile samples? If NO, list by QA#: YES NO
- 19. Were the custody papers checked against the sample receipt form? By whom? SP Date: 12/15/03

PART C

ANALYTICAL TEST RESULTS

C1

DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System		
Project Number:	7004	Date Sampled:	12/12/03
Client Sample ID:	NS03-03-06	Date Received:	12/15/03
Sample ID:	M031334-001	Date Analyzed:	12/23/03
Batch ID:	WG14167	Date Reported:	01/06/04
Method:	EPA 8260	Matrix:	Soil
Analyst:	David Splichal	Units:	ug/kg
		% Solids:	89.3
		Dilution:	1

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	11	1
74-87-3	Chloromethane	u	5.5	1
75-01-4	Vinyl Chloride	u	5.5	1
74-83-9	Bromomethane	u	5.5	1
75-00-3	Chloroethane	u	11	1
75-69-4	Trichlorofluoromethane	u	5.5	1
67-64-1	Acetone	u	55	20
75-35-4	1,1-Dichloroethene	u	5.5	1
75-09-2	Methylene Chloride	u	5.5	1
75-15-0	Carbon Disulfide	u	5.5	1
156-60-5	trans-1,2-Dichloroethene	u	5.5	1
75-34-3	1,1-Dichloroethane	u	5.5	1
78-93-3	2-Butanone	u	55	20
594-20-7	2,2-Dichloropropane	u	5.5	1
156-59-2	cis-1,2-Dichloroethene	u	5.5	1
67-66-3	Chloroform	u	5.5	1
74-97-5	Bromochloromethane	u	5.5	1
71-55-6	1,1,1-Trichloroethane	u	5.5	1
563-58-6	1,1-Dichloropropene	u	5.5	1
56-23-5	Carbon Tetrachloride	u	5.5	1
107-06-2	1,2-Dichloroethane	u	5.5	1
71-43-2	Benzene	u	5.5	1
79-01-6	Trichloroethene	u	5.5	1
78-87-5	1,2-Dichloropropane	u	5.5	1
75-27-4	Bromodichloromethane	u	5.5	1
74-95-3	Dibromomethane	u	5.5	1
108-10-1	4-Methyl-2-pentanone	u	55	20
10061-01-5	cis-1,3-Dichloropropene	u	5.5	1
108-88-3	Toluene	u	5.5	1
10061-02-6	trans-1,3-Dichloropropene	u	5.5	1
591-78-6	2-Hexanone	u	55	20
79-00-5	1,1,2-Trichloroethane	u	5.5	1
142-28-9	1,3-Dichloropropane	u	5.5	1
127-18-4	Tetrachloroethene	u	5.5	1
124-48-1	Dibromochloromethane	u	5.5	1
106-93-4	1,2-Dibromoethane	u	5.5	1
108-90-7	Chlorobenzene	u	5.5	1
100-41-4	Ethylbenzene	u	5.5	1
630-20-6	1,1,1,2-Tetrachloroethane	u	5.5	1
1330-20-7B	meta-/para-Xylenes	u	5.5	1
95-47-6	ortho-Xylene	u	5.5	1
100-42-5	Styrene	u	5.5	1
98-82-8	Isopropylbenzene	u	5.5	1
75-25-2	Bromoform	u	5.5	1
79-34-5	1,1,2,2-Tetrachloroethane	u	5.5	1
96-18-4	1,2,3-Trichloropropane	u	5.5	1
103-65-1	n-Propylbenzene	u	5.5	1
108-86-1	Bromobenzene	u	5.5	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

CZ

DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System		
Project Number:	7004	Date Sampled:	12/12/03
Client Sample ID:	NS03-03-06	Date Received:	12/15/03
Sample ID:	M031334-001	Date Analyzed:	12/23/03
Batch ID:	WG14167	Date Reported:	01/06/04
Method:	EPA 8260	Matrix:	Soil
Analyst:	David Splichal	Units:	ug/kg
		% Solids:	89.3
		Dilution:	1

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-67-8	1,3,5-Trimethylbenzene	u	5.5	1
95-49-8	2-Chlorotoluene	u	5.5	1
106-43-4	4-Chlorotoluene	u	5.5	1
98-06-6	tert-Butylbenzene	u	5.5	1
95-63-6	1,2,4-Trimethylbenzene	u	5.5	1
135-98-8	sec-Butylbenzene	u	5.5	1
99-87-6	p-Isopropyltoluene	u	5.5	1
541-73-1	1,3-Dichlorobenzene	u	5.5	1
106-46-7	1,4-Dichlorobenzene	u	5.5	1
104-51-8	n-Butylbenzene	u	5.5	1
95-50-1	1,2-Dichlorobenzene	u	5.5	1
96-12-8	1,2-Dibromo-3-chloropropane	u	28	6
120-82-1	1,2,4-Trichlorobenzene	u	28	10
87-68-3	Hexachlorobutadiene	u	28	10
91-20-3	Naphthalene	u	28	10
87-61-6	1,2,3-Trichlorobenzene	u	28	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	105.	80-120	80-120	50.0
1,2-Dichloroethane-d4	99.3	70-121	70-121	50.0
Toluene-d8	102.	81-117	81-117	50.0
4-Bromofluorobenzene	112.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

Quality Assurance / Quality Control

Method Blank:	WG14167-1	Laboratory Control Sample:	WG14167-2
Laboratory Matrix Duplicate:	WG14167-3	Dilution:	NA
Matrix Spike:	WG14167-4	Dilution:	NA
Matrix Spike Duplicate:	WG14167-5		

03

DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Sampled:	12/12/03	Matrix:	Soil
Project Number:	7004	Date Received:	12/15/03	Units:	ug/kg
Client Sample ID:	NS03-09-06	Date Analyzed:	12/23/03	% Solids:	86.4
Sample ID:	M031334-002	Date Reported:	01/06/04	Dilution:	1
Batch ID:	WG14167				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	11	1
74-87-3	Chloromethane	u	5.7	1
75-01-4	Vinyl Chloride	u	5.7	1
74-83-9	Bromomethane	u	5.7	1
75-00-3	Chloroethane	u	11	1
75-69-4	Trichlorofluoromethane	u	5.7	1
67-64-1	Acetone	u	57	20
75-35-4	1,1-Dichloroethene	u	5.7	1
75-09-2	Methylene Chloride	u	5.7	1
75-15-0	Carbon Disulfide	u	5.7	1
156-60-5	trans-1,2-Dichloroethene	u	5.7	1
75-34-3	1,1-Dichloroethane	u	5.7	1
78-93-3	2-Butanone	u	57	20
594-20-7	2,2-Dichloropropane	u	5.7	1
156-59-2	cis-1,2-Dichloroethene	u	5.7	1
67-66-3	Chloroform	u	5.7	1
74-97-5	Bromochloromethane	u	5.7	1
71-55-6	1,1,1-Trichloroethane	u	5.7	1
563-58-6	1,1-Dichloropropene	u	5.7	1
56-23-5	Carbon Tetrachloride	u	5.7	1
107-06-2	1,2-Dichloroethane	u	5.7	1
71-43-2	Benzene	u	5.7	1
79-01-6	Trichloroethene	u	5.7	1
78-87-5	1,2-Dichloropropane	u	5.7	1
75-27-4	Bromodichloromethane	u	5.7	1
74-95-3	Dibromomethane	u	5.7	1
108-10-1	4-Methyl-2-pentanone	u	57	20
10061-01-5	cis-1,3-Dichloropropene	u	5.7	1
108-88-3	Toluene	1.8 J	5.7	1
10061-02-6	trans-1,3-Dichloropropene	u	5.7	1
591-78-6	2-Hexanone	u	57	20
79-00-5	1,1,2-Trichloroethane	u	5.7	1
142-28-9	1,3-Dichloropropane	u	5.7	1
127-18-4	Tetrachloroethene	u	5.7	1
124-48-1	Dibromochloromethane	u	5.7	1
106-93-4	1,2-Dibromoethane	u	5.7	1
108-90-7	Chlorobenzene	u	5.7	1
100-41-4	Ethylbenzene	u	5.7	1
630-20-6	1,1,1,2-Tetrachloroethane	u	5.7	1
1330-20-7B	meta-/para-Xylenes	u	5.7	1
95-47-6	ortho-Xylene	u	5.7	1
100-42-5	Styrene	u	5.7	1
98-82-8	Isopropylbenzene	u	5.7	1
75-25-2	Bromoform	u	5.7	1
79-34-5	1,1,2,2-Tetrachloroethane	u	5.7	1
96-18-4	1,2,3-Trichloropropane	u	5.7	1
103-65-1	n-Propylbenzene	u	5.7	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)
 J: Estimated Concentration below laboratory reporting limit.

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DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System		
Project Number:	7004	Date Sampled:	12/12/03
Client Sample ID:	NS03-09-06	Date Received:	12/15/03
Sample ID:	MO31334-002	Date Analyzed:	12/23/03
Batch ID:	WG14167	Date Reported:	01/06/04
Method:	EPA 8260	Matrix:	Soil
Analyst:	David Splichal	Units:	ug/kg
		% Solids:	86.4
		Dilution:	1

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-86-1	Bromobenzene	u	5.7	1
108-67-8	1,3,5-Trimethylbenzene	u	5.7	1
95-49-8	2-Chlorotoluene	u	5.7	1
106-43-4	4-Chlorotoluene	u	5.7	1
98-06-6	tert-Butylbenzene	u	5.7	1
95-63-6	1,2,4-Trimethylbenzene	u	5.7	1
135-98-8	sec-Butylbenzene	u	5.7	1
99-87-6	p-Isopropyltoluene	u	5.7	1
541-73-1	1,3-Dichlorobenzene	u	5.7	1
106-46-7	1,4-Dichlorobenzene	u	5.7	1
104-51-8	n-Butylbenzene	u	5.7	1
95-50-1	1,2-Dichlorobenzene	u	5.7	1
96-12-8	1,2-Dibromo-3-chloropropane	u	28	6
120-82-1	1,2,4-Trichlorobenzene	u	28	10
87-68-3	Hexachlorobutadiene	u	28	10
91-20-3	Naphthalene	u	28	10
87-61-6	1,2,3-Trichlorobenzene	u	28	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	99.3	80-120	80-120	50.0
1,2-Dichloroethane-d4	104.	70-121	70-121	50.0
Toluene-d8	99.7	81-117	81-117	50.0
4-Bromofluorobenzene	110.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

Quality Assurance / Quality Control

Method Blank:	WG14167-1	Laboratory Control Sample:	WG14167-2
Laboratory Matrix Duplicate:	WG14167-3	Dilution:	NA
Matrix Spike:	WG14167-4	Dilution:	NA
Matrix Spike Duplicate:	WG14167-5		

05

DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System		
Project Number:	7004	Date Sampled:	12/12/03
Client Sample ID:	NS03-08-06	Date Received:	12/15/03
Sample ID:	M031334-003	Date Analyzed:	12/23/03
Batch ID:	WG14167	Date Reported:	01/06/04
Method:	EPA 8260	Matrix:	Soil
Analyst:	David Splichal	Units:	ug/kg
		% Solids:	82.4
		Dilution:	1

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	12	1
74-87-3	Chloromethane	u	6.0	1
75-01-4	Vinyl Chloride	u	6.0	1
74-83-9	Bromomethane	u	6.0	1
75-00-3	Chloroethane	u	12	1
75-69-4	Trichlorofluoromethane	u	6.0	1
67-64-1	Acetone	u	60	20
75-35-4	1,1-Dichloroethene	u	6.0	1
75-09-2	Methylene Chloride	u	6.0	1
75-15-0	Carbon Disulfide	u	6.0	1
156-60-5	trans-1,2-Dichloroethene	u	6.0	1
75-34-3	1,1-Dichloroethane	u	6.0	1
78-93-3	2-Butanone	u	60	20
594-20-7	2,2-Dichloropropane	u	6.0	1
156-59-2	cis-1,2-Dichloroethene	u	6.0	1
67-66-3	Chloroform	u	6.0	1
74-97-5	Bromochloromethane	u	6.0	1
71-55-6	1,1,1-Trichloroethane	u	6.0	1
563-58-6	1,1-Dichloropropene	u	6.0	1
56-23-5	Carbon Tetrachloride	u	6.0	1
107-06-2	1,2-Dichloroethane	u	6.0	1
71-43-2	Benzene	u	6.0	1
79-01-6	Trichloroethene	u	6.0	1
78-87-5	1,2-Dichloropropane	u	6.0	1
75-27-4	Bromodichloromethane	u	6.0	1
74-95-3	Dibromomethane	u	6.0	1
108-10-1	4-Methyl-2-pentanone	u	60	20
10061-01-5	cis-1,3-Dichloropropene	u	6.0	1
108-88-3	Toluene	u	6.0	1
10061-02-6	trans-1,3-Dichloropropene	u	6.0	1
591-78-6	2-Hexanone	u	60	20
79-00-5	1,1,2-Trichloroethane	u	6.0	1
142-28-9	1,3-Dichloropropane	u	6.0	1
127-18-4	Tetrachloroethene	u	6.0	1
124-48-1	Dibromochloromethane	u	6.0	1
106-93-4	1,2-Dibromoethane	u	6.0	1
108-90-7	Chlorobenzene	u	6.0	1
100-41-4	Ethylbenzene	u	6.0	1
630-20-6	1,1,1,2-Tetrachloroethane	u	6.0	1
1330-20-7B	meta-/para-Xylenes	u	6.0	1
95-47-6	ortho-Xylene	u	6.0	1
100-42-5	Styrene	u	6.0	1
98-82-8	Isopropylbenzene	u	6.0	1
75-25-2	Bromoform	u	6.0	1
79-34-5	1,1,2,2-Tetrachloroethane	u	6.0	1
96-18-4	1,2,3-Trichloropropane	u	6.0	1
103-65-1	n-Propylbenzene	u	6.0	1
108-86-1	Bromobenzene	u	6.0	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Cl6

DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Sampled:	12/12/03	Matrix:	Soil
Project Number:	7004	Date Received:	12/15/03	Units:	ug/kg
Client Sample ID:	NS03-08-06	Date Analyzed:	12/23/03	% Solids:	82.4
Sample ID:	M031334-003	Date Reported:	01/06/04	Dilution:	1
Batch ID:	WG14167				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-67-8	1,3,5-Trimethylbenzene	u	6.0	1
95-49-8	2-Chlorotoluene	u	6.0	1
106-43-4	4-Chlorotoluene	u	6.0	1
98-06-6	tert-Butylbenzene	u	6.0	1
95-63-6	1,2,4-Trimethylbenzene	u	6.0	1
135-98-8	sec-Butylbenzene	u	6.0	1
99-87-6	p-Isopropyltoluene	u	6.0	1
541-73-1	1,3-Dichlorobenzene	u	6.0	1
106-46-7	1,4-Dichlorobenzene	u	6.0	1
104-51-8	n-Butylbenzene	u	6.0	1
95-50-1	1,2-Dichlorobenzene	u	6.0	1
96-12-8	1,2-Dibromo-3-chloropropane	u	30	6
120-82-1	1,2,4-Trichlorobenzene	u	30	10
87-68-3	Hexachlorobutadiene	u	30	10
91-20-3	Naphthalene	u	30	10
87-61-6	1,2,3-Trichlorobenzene	u	30	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	108.	80-120	80-120	50.0
1,2-Dichloroethane-d4	112.	70-121	70-121	50.0
Toluene-d8	101.	81-117	81-117	50.0
4-Bromofluorobenzene	104.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

Quality Assurance / Quality Control

Method Blank:	WG14167-1	Laboratory Control Sample:	WG14167-2
Laboratory Matrix Duplicate:	WG14167-3	Dilution:	NA
Matrix Spike:	WG14167-4	Dilution:	NA
Matrix Spike Duplicate:	WG14167-5		

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DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name: Nellis AFB - Hydrant Fuel System
 Project Number: 7004
 Client Sample ID: NS03-07-06
 Sample ID: M031334-004
 Batch ID: WG14167
 Method: EPA 8260
 Analyst: David Splichal
 Date Sampled: 12/12/03
 Date Received: 12/15/03
 Date Analyzed: 12/23/03
 Date Reported: 01/06/04
 Matrix: Soil
 Units: ug/kg
 % Solids: 81.3
 Dilution: 1

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	12	1
74-87-3	Chloromethane	u	6.0	1
75-01-4	Vinyl Chloride	u	6.0	1
74-83-9	Bromomethane	u	6.0	1
75-00-3	Chloroethane	u	12	1
75-69-4	Trichlorofluoromethane	u	6.0	1
67-64-1	Acetone	u	60	20
75-35-4	1,1-Dichloroethene	u	6.0	1
75-09-2	Methylene Chloride	u	6.0	1
75-15-0	Carbon Disulfide	u	6.0	1
156-60-5	trans-1,2-Dichloroethene	u	6.0	1
75-34-3	1,1-Dichloroethane	u	6.0	1
78-93-3	2-Butanone	u	60	20
594-20-7	2,2-Dichloropropane	u	6.0	1
156-59-2	cis-1,2-Dichloroethene	u	6.0	1
67-66-3	Chloroform	u	6.0	1
74-97-5	Bromochloromethane	u	6.0	1
71-55-6	1,1,1-Trichloroethane	u	6.0	1
563-58-6	1,1-Dichloropropene	u	6.0	1
56-23-5	Carbon Tetrachloride	u	6.0	1
107-06-2	1,2-Dichloroethane	u	6.0	1
71-43-2	Benzene	u	6.0	1
79-01-6	Trichloroethene	u	6.0	1
78-87-5	1,2-Dichloropropane	u	6.0	1
75-27-4	Bromodichloromethane	u	6.0	1
74-95-3	Dibromomethane	u	6.0	1
108-10-1	4-Methyl-2-pentanone	u	60	20
10061-01-5	cis-1,3-Dichloropropene	u	6.0	1
108-88-3	Toluene	u	6.0	1
10061-02-6	trans-1,3-Dichloropropene	u	6.0	1
591-78-6	2-Hexanone	u	60	20
79-00-5	1,1,2-Trichloroethane	u	6.0	1
142-28-9	1,3-Dichloropropane	u	6.0	1
127-18-4	Tetrachloroethene	u	6.0	1
124-48-1	Dibromochloromethane	u	6.0	1
106-93-4	1,2-Dibromoethane	u	6.0	1
108-90-7	Chlorobenzene	u	6.0	1
100-41-4	Ethylbenzene	u	6.0	1
630-20-6	1,1,1,2-Tetrachloroethane	u	6.0	1
1330-20-7B	meta-/para-Xylenes	u	6.0	1
95-47-6	ortho-Xylene	u	6.0	1
100-42-5	Styrene	u	6.0	1
98-82-8	Isopropylbenzene	u	6.0	1
75-25-2	Bromoform	u	6.0	1
79-34-5	1,1,2,2-Tetrachloroethane	u	6.0	1
96-18-4	1,2,3-Trichloropropane	u	6.0	1
103-65-1	n-Propylbenzene	u	6.0	1
108-86-1	Bromobenzene	u	6.0	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

C8

DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System		
Project Number:	7004	Date Sampled:	12/12/03
Client Sample ID:	NS03-07-06	Date Received:	12/15/03
Sample ID:	MO31334-004	Date Analyzed:	12/23/03
Batch ID:	WG14167	Date Reported:	01/06/04
Method:	EPA 8260	Matrix:	Soil
Analyst:	David Splichal	Units:	ug/kg
		% Solids:	81.3
		Dilution:	1

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-67-8	1,3,5-Trimethylbenzene	u	6.0	1
95-49-8	2-Chlorotoluene	u	6.0	1
106-43-4	4-Chlorotoluene	u	6.0	1
98-06-6	tert-Butylbenzene	u	6.0	1
95-63-6	1,2,4-Trimethylbenzene	u	6.0	1
135-98-8	sec-Butylbenzene	u	6.0	1
99-87-6	p-Isopropyltoluene	u	6.0	1
541-73-1	1,3-Dichlorobenzene	u	6.0	1
106-46-7	1,4-Dichlorobenzene	u	6.0	1
104-51-8	n-Butylbenzene	u	6.0	1
95-50-1	1,2-Dichlorobenzene	u	6.0	1
96-12-8	1,2-Dibromo-3-chloropropane	u	30	6
120-82-1	1,2,4-Trichlorobenzene	u	30	10
87-68-3	Hexachlorobutadiene	u	30	10
91-20-3	Naphthalene	u	30	10
87-61-6	1,2,3-Trichlorobenzene	u	30	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	115.	80-120	80-120	50.0
1,2-Dichloroethane-d4	104.	70-121	70-121	50.0
Toluene-d8	102.	81-117	81-117	50.0
4-Bromofluorobenzene	111.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

Quality Assurance / Quality Control

Method Blank:	WG14167-1	Laboratory Control Sample:	WG14167-2
Laboratory Matrix Duplicate:	WG14167-3	Dilution:	NA
Matrix Spike:	WG14167-4	Dilution:	NA
Matrix Spike Duplicate:	WG14167-5		

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DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Sampled:	12/13/03	Matrix:	Soil
Project Number:	7004	Date Received:	12/15/03	Units:	ug/kg
Client Sample ID:	NS03-05-06	Date Analyzed:	12/23/03	% Solids:	91.2
Sample ID:	M031334-005	Date Reported:	01/06/04	Dilution:	1
Batch ID:	WG14167				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	11	1
74-87-3	Chloromethane	u	5.4	1
75-01-4	Vinyl Chloride	u	5.4	1
74-83-9	Bromomethane	u	5.4	1
75-00-3	Chloroethane	u	11	1
75-69-4	Trichlorofluoromethane	u	5.4	1
67-64-1	Acetone	u	54	20
75-35-4	1,1-Dichloroethene	u	5.4	1
75-09-2	Methylene Chloride	u	5.4	1
75-15-0	Carbon Disulfide	u	5.4	1
156-60-5	trans-1,2-Dichloroethene	u	5.4	1
75-34-3	1,1-Dichloroethane	u	5.4	1
78-93-3	2-Butanone	u	54	20
594-20-7	2,2-Dichloropropane	u	5.4	1
156-59-2	cis-1,2-Dichloroethene	u	5.4	1
67-66-3	Chloroform	u	5.4	1
74-97-5	Bromochloromethane	u	5.4	1
71-55-6	1,1,1-Trichloroethane	u	5.4	1
563-58-6	1,1-Dichloropropene	u	5.4	1
56-23-5	Carbon Tetrachloride	u	5.4	1
107-06-2	1,2-Dichloroethane	u	5.4	1
71-43-2	Benzene	u	5.4	1
79-01-6	Trichloroethene	u	5.4	1
78-87-5	1,2-Dichloropropane	u	5.4	1
75-27-4	Bromodichloromethane	u	5.4	1
74-95-3	Dibromomethane	u	5.4	1
108-10-1	4-Methyl-2-pentanone	u	54	20
10061-01-5	cis-1,3-Dichloropropene	u	5.4	1
108-88-3	Toluene	u	5.4	1
10061-02-6	trans-1,3-Dichloropropene	u	5.4	1
591-78-6	2-Hexanone	u	54	20
79-00-5	1,1,2-Trichloroethane	u	5.4	1
142-28-9	1,3-Dichloropropane	u	5.4	1
127-18-4	Tetrachloroethene	u	5.4	1
124-48-1	Dibromochloromethane	u	5.4	1
106-93-4	1,2-Dibromoethane	u	5.4	1
108-90-7	Chlorobenzene	u	5.4	1
100-41-4	Ethylbenzene	u	5.4	1
630-20-6	1,1,1,2-Tetrachloroethane	u	5.4	1
1330-20-7B	meta-/para-Xylenes	u	5.4	1
95-47-6	ortho-Xylene	u	5.4	1
100-42-5	Styrene	u	5.4	1
98-82-8	Isopropylbenzene	u	5.4	1
75-25-2	Bromoform	u	5.4	1
79-34-5	1,1,2,2-Tetrachloroethane	u	5.4	1
96-18-4	1,2,3-Trichloropropane	u	5.4	1
103-65-1	n-Propylbenzene	u	5.4	1
108-86-1	Bromobenzene	u	5.4	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

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DEPARTMENT OF THE ARMY
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Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Sampled:	12/13/03	Matrix:	Soil
Project Number:	7004	Date Received:	12/15/03	Units:	ug/kg
Client Sample ID:	NS03-05-06	Date Analyzed:	12/23/03	% Solids:	91.2
Sample ID:	M031334-005	Date Reported:	01/06/04	Dilution:	1
Batch ID:	WG14167				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-67-8	1,3,5-Trimethylbenzene	u	5.4	1
95-49-8	2-Chlorotoluene	u	5.4	1
106-43-4	4-Chlorotoluene	u	5.4	1
98-06-6	tert-Butylbenzene	u	5.4	1
95-63-6	1,2,4-Trimethylbenzene	u	5.4	1
135-98-8	sec-Butylbenzene	u	5.4	1
99-87-6	p-Isopropyltoluene	u	5.4	1
541-73-1	1,3-Dichlorobenzene	u	5.4	1
106-46-7	1,4-Dichlorobenzene	u	5.4	1
104-51-8	n-Butylbenzene	u	5.4	1
95-50-1	1,2-Dichlorobenzene	u	5.4	1
96-12-8	1,2-Dibromo-3-chloropropane	u	27	5
120-82-1	1,2,4-Trichlorobenzene	u	27	10
87-68-3	Hexachlorobutadiene	u	27	10
91-20-3	Naphthalene	u	27	10
87-61-6	1,2,3-Trichlorobenzene	u	27	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	115.	80-120	80-120	50.0
1,2-Dichloroethane-d4	111.	70-121	70-121	50.0
Toluene-d8	102.	81-117	81-117	50.0
4-Bromofluorobenzene	115.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

Quality Assurance / Quality Control

Method Blank:	WG14167-1	Laboratory Control Sample:	WG14167-2
Laboratory Matrix Duplicate:	WG14167-3	Dilution:	NA
Matrix Spike:	WG14167-4	Dilution:	NA
Matrix Spike Duplicate:	WG14167-5		

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DEPARTMENT OF THE ARMY
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Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System		Matrix:	Soil	
Project Number:	7004	Date Sampled:	12/13/03	Units:	ug/kg
Client Sample ID:	NS03-06-06	Date Received:	12/15/03	% Solids:	88.2
Sample ID:	M031334-006	Date Analyzed:	12/23/03	Dilution:	1
Batch ID:	WG14167	Date Reported:	01/06/04		
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	11	1
74-87-3	Chloromethane	u	5.6	1
75-01-4	Vinyl Chloride	u	5.6	1
74-83-9	Bromomethane	u	5.6	1
75-00-3	Chloroethane	u	11	1
75-69-4	Trichlorofluoromethane	u	5.6	1
67-64-1	Acetone	u	56	20
75-35-4	1,1-Dichloroethene	u	5.6	1
75-09-2	Methylene Chloride	u	5.6	1
75-15-0	Carbon Disulfide	u	5.6	1
156-60-5	trans-1,2-Dichloroethene	u	5.6	1
75-34-3	1,1-Dichloroethane	u	5.6	1
78-93-3	2-Butanone	u	56	20
594-20-7	2,2-Dichloropropane	u	5.6	1
156-59-2	cis-1,2-Dichloroethene	u	5.6	1
67-66-3	Chloroform	u	5.6	1
74-97-5	Bromochloromethane	u	5.6	1
71-55-6	1,1,1-Trichloroethane	u	5.6	1
563-58-6	1,1-Dichloropropene	u	5.6	1
56-23-5	Carbon Tetrachloride	u	5.6	1
107-06-2	1,2-Dichloroethane	u	5.6	1
71-43-2	Benzene	u	5.6	1
79-01-6	Trichloroethene	u	5.6	1
78-87-5	1,2-Dichloropropane	u	5.6	1
75-27-4	Bromodichloromethane	u	5.6	1
74-95-3	Dibromomethane	u	5.6	1
108-10-1	4-Methyl-2-pentanone	u	56	20
10061-01-5	cis-1,3-Dichloropropene	u	5.6	1
108-88-3	Toluene	u	5.6	1
10061-02-6	trans-1,3-Dichloropropene	u	5.6	1
591-78-6	2-Hexanone	u	56	20
79-00-5	1,1,2-Trichloroethane	u	5.6	1
142-28-9	1,3-Dichloropropane	u	5.6	1
127-18-4	Tetrachloroethene	u	5.6	1
124-48-1	Dibromochloromethane	u	5.6	1
106-93-4	1,2-Dibromoethane	u	5.6	1
108-90-7	Chlorobenzene	u	5.6	1
100-41-4	Ethylbenzene	u	5.6	1
630-20-6	1,1,1,2-Tetrachloroethane	u	5.6	1
1330-20-7B	meta-/para-Xylenes	u	5.6	1
95-47-6	ortho-Xylene	u	5.6	1
100-42-5	Styrene	u	5.6	1
98-82-8	Isopropylbenzene	u	5.6	1
75-25-2	Bromoform	u	5.6	1
79-34-5	1,1,2,2-Tetrachloroethane	u	5.6	1
96-18-4	1,2,3-Trichloropropane	u	5.6	1
103-65-1	n-Propylbenzene	u	5.6	1
108-86-1	Bromobenzene	u	5.6	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System		Date Sampled:	12/13/03	Matrix:	Soil
Project Number:	7004	Date Received:	12/15/03	Units:	ug/kg	
Client Sample ID:	NS03-06-06	Date Analyzed:	12/23/03	% Solids:	88.2	
Sample ID:	M031334-006	Date Reported:	01/06/04	Dilution:	1	
Batch ID:	WG14167					
Method:	EPA 8260					
Analyst:	David Splichal					

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-67-8	1,3,5-Trimethylbenzene	u	5.6	1
95-49-8	2-Chlorotoluene	u	5.6	1
106-43-4	4-Chlorotoluene	u	5.6	1
98-06-6	tert-Butylbenzene	u	5.6	1
95-63-6	1,2,4-Trimethylbenzene	u	5.6	1
135-98-8	sec-Butylbenzene	u	5.6	1
99-87-6	p-Isopropyltoluene	u	5.6	1
541-73-1	1,3-Dichlorobenzene	u	5.6	1
106-46-7	1,4-Dichlorobenzene	u	5.6	1
104-51-8	n-Butylbenzene	u	5.6	1
95-50-1	1,2-Dichlorobenzene	u	5.6	1
96-12-8	1,2-Dibromo-3-chloropropane	u	28	6
120-82-1	1,2,4-Trichlorobenzene	u	28	10
87-68-3	Hexachlorobutadiene	u	28	10
91-20-3	Naphthalene	u	28	10
87-61-6	1,2,3-Trichlorobenzene	u	28	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	107.	80-120	80-120	50.0
1,2-Dichloroethane-d4	108.	70-121	70-121	50.0
Toluene-d8	95.7	81-117	81-117	50.0
4-Bromofluorobenzene	116.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

Quality Assurance / Quality Control

Method Blank:	WG14167-1	Laboratory Control Sample:	WG14167-2
Laboratory Matrix Duplicate:	WG14167-3	Dilution:	NA
Matrix Spike:	WG14167-4	Dilution:	NA
Matrix Spike Duplicate:	WG14167-5		

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DEPARTMENT OF THE ARMY
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Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Sampled:	12/13/03	Matrix:	Soil
Project Number:	7004	Date Received:	12/15/03	Units:	ug/kg
Client Sample ID:	NS03-04-06	Date Analyzed:	12/23/03	% Solids:	92.4
Sample ID:	M031334-007	Date Reported:	01/06/04	Dilution:	1
Batch ID:	WG14167				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	11	1
74-87-3	Chloromethane	u	5.4	1
75-01-4	Vinyl Chloride	u	5.4	1
74-83-9	Bromomethane	u	5.4	1
75-00-3	Chloroethane	u	11	1
75-69-4	Trichlorofluoromethane	u	5.4	1
67-64-1	Acetone	u	54	20
75-35-4	1,1-Dichloroethene	u	5.4	1
75-09-2	Methylene Chloride	u	5.4	1
75-15-0	Carbon Disulfide	u	5.4	1
156-60-5	trans-1,2-Dichloroethene	u	5.4	1
75-34-3	1,1-Dichloroethane	u	54	20
78-93-3	2-Butanone	u	5.4	1
594-20-7	2,2-Dichloropropane	u	5.4	1
156-59-2	cis-1,2-Dichloroethene	u	5.4	1
67-66-3	Chloroform	u	5.4	1
74-97-5	Bromochloromethane	u	5.4	1
71-55-6	1,1,1-Trichloroethane	u	5.4	1
563-58-6	1,1-Dichloropropene	u	5.4	1
56-23-5	Carbon Tetrachloride	u	5.4	1
107-06-2	1,2-Dichloroethane	u	5.4	1
71-43-2	Benzene	u	5.4	1
79-01-6	Trichloroethene	u	5.4	1
78-87-5	1,2-Dichloropropane	u	5.4	1
75-27-4	Bromodichloromethane	u	5.4	1
74-95-3	Dibromomethane	u	54	20
108-10-1	4-Methyl-2-pentanone	u	5.4	1
10061-01-5	cis-1,3-Dichloropropene	u	5.4	1
108-88-3	Toluene	u	5.4	1
10061-02-6	trans-1,3-Dichloropropene	u	54	20
591-78-6	2-Hexanone	u	5.4	1
79-00-5	1,1,2-Trichloroethane	u	5.4	1
142-28-9	1,3-Dichloropropane	u	5.4	1
127-18-4	Tetrachloroethene	u	5.4	1
124-48-1	Dibromochloromethane	u	5.4	1
106-93-4	1,2-Dibromoethane	u	5.4	1
108-90-7	Chlorobenzene	u	5.4	1
100-41-4	Ethylbenzene	u	5.4	1
630-20-6	1,1,1,2-Tetrachloroethane	u	5.4	1
1330-20-7B	meta-/para-Xylenes	u	5.4	1
95-47-6	ortho-Xylene	u	5.4	1
100-42-5	Styrene	u	5.4	1
98-82-8	Isopropylbenzene	u	5.4	1
75-25-2	Bromoform	u	5.4	1
79-34-5	1,1,2,2-Tetrachloroethane	u	5.4	1
96-18-4	1,2,3-Trichloropropane	u	5.4	1
103-65-1	n-Propylbenzene	u	5.4	1
108-86-1	Bromobenzene	u	5.4	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

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DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System		
Project Number:	7004	Date Sampled:	12/13/03
Client Sample ID:	NS03-04-06	Date Received:	12/15/03
Sample ID:	M031334-007	Date Analyzed:	12/23/03
Batch ID:	WG14167	Date Reported:	01/06/04
Method:	EPA 8260	Matrix:	Soil
Analyst:	David Splichal	Units:	ug/kg
		% Solids:	92.4
		Dilution:	1

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-67-8	1,3,5-Trimethylbenzene	u	5.4	1
95-49-8	2-Chlorotoluene	u	5.4	1
106-43-4	4-Chlorotoluene	u	5.4	1
98-06-6	tert-Butylbenzene	u	5.4	1
95-63-6	1,2,4-Trimethylbenzene	u	5.4	1
135-98-8	sec-Butylbenzene	u	5.4	1
99-87-6	p-Isopropyltoluene	u	5.4	1
541-73-1	1,3-Dichlorobenzene	u	5.4	1
106-46-7	1,4-Dichlorobenzene	u	5.4	1
104-51-8	n-Butylbenzene	u	5.4	1
95-50-1	1,2-Dichlorobenzene	u	5.4	1
96-12-8	1,2-Dibromo-3-chloropropane	u	27	5
120-82-1	1,2,4-Trichlorobenzene	u	27	10
87-68-3	Hexachlorobutadiene	u	27	10
91-20-3	Naphthalene	u	27	10
87-61-6	1,2,3-Trichlorobenzene	u	27	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	119.	80-120	80-120	50.0
1,2-Dichloroethane-d4	118.	70-121	70-121	50.0
Toluene-d8	101.	81-117	81-117	50.0
4-Bromofluorobenzene	114.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

Quality Assurance / Quality Control

Method Blank:	WG14167-1	Laboratory Control Sample:	WG14167-2
Laboratory Matrix Duplicate:	WG14167-3	Dilution:	NA
Matrix Spike:	WG14167-4	Dilution:	NA
Matrix Spike Duplicate:	WG14167-5		

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DEPARTMENT OF THE ARMY
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Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Sampled:	12/13/03	Matrix:	Soil
Project Number:	7004	Date Received:	12/15/03	Units:	ug/kg
Client Sample ID:	NS03-01-06	Date Analyzed:	12/23/03	% Solids:	88.5
Sample ID:	M031334-008	Date Reported:	01/06/04	Dilution:	1
Batch ID:	WG14167				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	11	1
74-87-3	Chloromethane	u	5.6	1
75-01-4	Vinyl Chloride	u	5.6	1
74-83-9	Bromomethane	u	5.6	1
75-00-3	Chloroethane	u	11	1
75-69-4	Trichlorofluoromethane	u	5.6	1
67-64-1	Acetone	u	56	20
75-35-4	1,1-Dichloroethene	u	5.6	1
75-09-2	Methylene Chloride	u	5.6	1
75-15-0	Carbon Disulfide	u	5.6	1
156-60-5	trans-1,2-Dichloroethene	u	5.6	1
75-34-3	1,1-Dichloroethane	u	5.6	1
78-93-3	2-Butanone	u	56	20
594-20-7	2,2-Dichloropropane	u	5.6	1
156-59-2	cis-1,2-Dichloroethene	u	5.6	1
67-66-3	Chloroform	u	5.6	1
74-97-5	Bromochloromethane	u	5.6	1
71-55-6	1,1,1-Trichloroethane	u	5.6	1
563-58-6	1,1-Dichloropropene	u	5.6	1
56-23-5	Carbon Tetrachloride	u	5.6	1
107-06-2	1,2-Dichloroethane	u	5.6	1
71-43-2	Benzene	u	5.6	1
79-01-6	Trichloroethene	u	5.6	1
78-87-5	1,2-Dichloropropane	u	5.6	1
75-27-4	Bromodichloromethane	u	5.6	1
74-95-3	Dibromomethane	u	5.6	1
108-10-1	4-Methyl-2-pentanone	u	56	20
10061-01-5	cis-1,3-Dichloropropene	u	5.6	1
108-88-3	Toluene	u	5.6	1
10061-02-6	trans-1,3-Dichloropropene	u	5.6	1
591-78-6	2-Hexanone	u	56	20
79-00-5	1,1,2-Trichloroethane	u	5.6	1
142-28-9	1,3-Dichloropropane	u	5.6	1
127-18-4	Tetrachloroethene	u	5.6	1
124-48-1	Dibromochloromethane	u	5.6	1
106-93-4	1,2-Dibromoethane	u	5.6	1
108-90-7	Chlorobenzene	u	5.6	1
100-41-4	Ethylbenzene	u	5.6	1
630-20-6	1,1,1,2-Tetrachloroethane	u	5.6	1
1330-20-7B	meta-/para-Xylenes	u	5.6	1
95-47-6	ortho-Xylene	u	5.6	1
100-42-5	Styrene	u	5.6	1
98-82-8	Isopropylbenzene	u	5.6	1
75-25-2	Bromoform	u	5.6	1
79-34-5	1,1,2,2-Tetrachloroethane	u	5.6	1
96-18-4	1,2,3-Trichloropropane	u	5.6	1
103-65-1	n-Propylbenzene	u	5.6	1
108-86-1	Bromobenzene	u	5.6	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

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Omaha Laboratory

VOA Sample Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Sampled:	12/13/03	Matrix:	Soil
Project Number:	7004	Date Received:	12/15/03	Units:	ug/kg
Client Sample ID:	NS03-01-06	Date Analyzed:	12/23/03	% Solids:	88.5
Sample ID:	M031334-008	Date Reported:	01/06/04	Dilution:	1
Batch ID:	WG14167				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-67-8	1,3,5-Trimethylbenzene	u	5.6	1
95-49-8	2-Chlorotoluene	u	5.6	1
106-43-4	4-Chlorotoluene	u	5.6	1
98-06-6	tert-Butylbenzene	u	5.6	1
95-63-6	1,2,4-Trimethylbenzene	u	5.6	1
135-98-8	sec-Butylbenzene	u	5.6	1
99-87-6	p-Isopropyltoluene	u	5.6	1
541-73-1	1,3-Dichlorobenzene	u	5.6	1
106-46-7	1,4-Dichlorobenzene	u	5.6	1
104-51-8	n-Butylbenzene	u	5.6	1
95-50-1	1,2-Dichlorobenzene	u	5.6	1
96-12-8	1,2-Dibromo-3-chloropropane	u	28	6
120-82-1	1,2,4-Trichlorobenzene	u	28	10
87-68-3	Hexachlorobutadiene	u	28	10
91-20-3	Naphthalene	u	28	10
87-61-6	1,2,3-Trichlorobenzene	u	28	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	104.	80-120	80-120	50.0
1,2-Dichloroethane-d4	98.6	70-121	70-121	50.0
Toluene-d8	104.	81-117	81-117	50.0
4-Bromofluorobenzene	118.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

Quality Assurance / Quality Control

Method Blank:	WG14167-1	Laboratory Control Sample:	WG14167-2
Laboratory Matrix Duplicate:	WG14167-3	Dilution:	NA
Matrix Spike:	WG14167-4	Dilution:	NA
Matrix Spike Duplicate:	WG14167-5		

Subject: Gasoline Range Organics results for Nellis AFB – Hydrant Fuel System
Project #7004
Method: SW-846, #8260
Date analyzed: 22-Dec-2003 (WG14164)

Method Blank = Not Detected at 100 ug/kg.

Laboratory Control Sample = 98.0% recovered at a spiking level of 200 ug/kg.

M031334-001 = Not Detected at 100 ug/kg.

M031334-002 = Not Detected at 100 ug/kg.

M031334-003 = Not Detected at 100 ug/kg.

M031334-004 = Not Detected at 100 ug/kg.

M031334-005 = Not Detected at 100 ug/kg.

M031334-006 = Not Detected at 100 ug/kg.

M031334-007 = Not Detected at 100 ug/kg.

M031334-008 = Not Detected at 100 ug/kg.

M031334-001 (Laboratory Duplicate) = Not Detected at 100 ug/kg

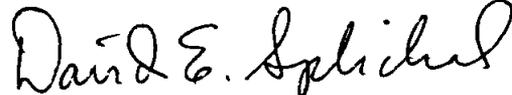
RPD (sample/LD) = not applicable

M031334-002 (Matrix Spike) = 112% recovered at a spiking level of 200-ug/kg.

M031334-002 (Matrix Spike Duplicate) = 113% recovered at a spiking
Level of 200-ug/kg.

RPD (MS/MSD) = 1%

Acceptable limit for MS/MSD/LCS recoveries: 50% - 150%
Acceptable limit for RPD (MS/MSD) = 40%.
Acceptable limit for RPD (sample/LD) = 40%.

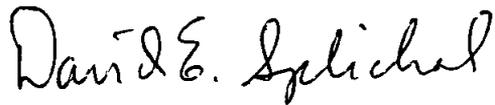


David Splichal, ECB – Omaha Facility, Organic Section Team Leader

Narrative for WG14167 – Volatile Organics
Project name: Nellis AFB – Hydrant Fuel System
Project number: 7004

Due to excessive foaming when sodium bisulfate was added to the soil, these samples were mixed with only water. The unusual sample matrix caused purging efficiency problems which resulted in loss of sensitivity with the GC/MS. A five point calibration was analyzed with this batch of samples with the lowest standard set at 5 ug/kg. Due to the loss of sensitivity, some estimated values (J-flags) may not be reportable. The Sample Quantitation Limit (SQL) should be used for site specific decisions.

Results for the laboratory duplicate sample are not available for this workgroup due to a purging problem with the sample. The internal standard and surrogate standard area counts were very low for this sample which rendered the data unusable.


David E. Splichal, Organic Section Team Leader

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VOA (Method Blank) Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Analyzed:	12/23/03	Matrix:	Soil
Project Number:	7004	Date Reported:	01/06/04	Units:	ug/kg
Method Blank ID:	WG14167-1				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
75-71-8	Dichlorodifluoromethane	u	9.9	1
74-87-3	Chloromethane	u	4.9	1
75-01-4	Vinyl Chloride	u	4.9	1
74-83-9	Bromomethane	u	9.9	1
75-00-3	Chloroethane	u	4.9	1
75-69-4	Trichlorofluoromethane	u	49.	20
67-64-1	Acetone	u	4.9	1
75-35-4	1,1-Dichloroethene	u	4.9	1
75-09-2	Methylene Chloride	u	4.9	1
75-15-0	Carbon Disulfide	u	4.9	1
156-60-5	trans-1,2-Dichloroethene	u	4.9	1
75-34-3	1,1-Dichloroethane	u	49.	20
78-93-3	2-Butanone	u	4.9	1
594-20-7	2,2-Dichloropropane	u	4.9	1
156-59-2	cis-1,2-Dichloroethene	u	4.9	1
67-66-3	Chloroform	u	4.9	1
74-97-5	Bromochloromethane	u	4.9	1
71-55-6	1,1,1-Trichloroethane	u	4.9	1
563-58-6	1,1-Dichloropropene	u	4.9	1
56-23-5	Carbon Tetrachloride	u	4.9	1
107-06-2	1,2-Dichloroethane	u	4.9	1
71-43-2	Benzene	u	4.9	1
79-01-6	Trichloroethene	u	4.9	1
78-87-5	1,2-Dichloropropane	u	4.9	1
75-27-4	Bromodichloromethane	u	4.9	1
74-95-3	Dibromomethane	u	49.	20
108-10-1	4-Methyl-2-pentanone	u	4.9	1
10061-01-5	cis-1,3-Dichloropropene	u	4.9	1
108-88-3	Toluene	u	4.9	1
10061-02-6	trans-1,3-Dichloropropene	u	49.	20
591-78-6	2-Hexanone	u	4.9	1
79-00-5	1,1,2-Trichloroethane	u	4.9	1
142-28-9	1,3-Dichloropropane	u	4.9	1
127-18-4	Tetrachloroethene	u	4.9	1
124-48-1	Dibromochloromethane	u	4.9	1
106-93-4	1,2-Dibromoethane	u	4.9	1
108-90-7	Chlorobenzene	u	4.9	1
100-41-4	Ethylbenzene	u	4.9	1
630-20-6	1,1,1,2-Tetrachloroethane	u	4.9	1
1330-20-7B	meta-/para-Xylenes	u	4.9	1
95-47-6	ortho-Xylene	u	4.9	1
100-42-5	Styrene	u	4.9	1
98-82-8	Isopropylbenzene	u	4.9	1
75-25-2	Bromoform	u	4.9	1
79-34-5	1,1,2,2-Tetrachloroethane	u	4.9	1
96-18-4	1,2,3-Trichloropropane	u	4.9	1
103-65-1	n-Propylbenzene	u	4.9	1
108-86-1	Bromobenzene	u	4.9	1

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

MDL determined according to procedures in 40CFR Appendix B to part 136

420 South 18th Street Omaha, NE 68102

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DEPARTMENT OF THE ARMY
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Omaha Laboratory

VOA (Method Blank) Report

Project Name: Nellis AFB - Hydrant Fuel System
Project Number: 7004
Method Blank ID: WG14167-1
Method: EPA 8260
Analyst: David Splichal
Date Analyzed: 12/23/03
Date Reported: 01/06/04
Matrix: Soil
Units: ug/kg

CAS Number	Compound	Result	Sample Quant Limit	Sample Det Limit
108-67-8	1,3,5-Trimethylbenzene	u	4.9	1
95-49-8	2-Chlorotoluene	u	4.9	1
106-43-4	4-Chlorotoluene	u	4.9	1
98-06-6	tert-Butylbenzene	u	4.9	1
95-63-6	1,2,4-Trimethylbenzene	u	4.9	1
135-98-8	sec-Butylbenzene	u	4.9	1
99-87-6	p-Isopropyltoluene	u	4.9	1
541-73-1	1,3-Dichlorobenzene	u	4.9	1
106-46-7	1,4-Dichlorobenzene	u	4.9	1
104-51-8	n-Butylbenzene	u	4.9	1
95-50-1	1,2-Dichlorobenzene	u	25.	5
96-12-8	1,2-Dibromo-3-chloropropane	u	25.	10
120-82-1	1,2,4-Trichlorobenzene	u	25.	10
87-68-3	Hexachlorobutadiene	u	25.	10
91-20-3	Naphthalene	u	25.	10
87-61-6	1,2,3-Trichlorobenzene	u	25.	10

u: Below Sample Detection Limit (SDL >= MDL x Dilution)

MDL determined according to procedures in 40CFR Appendix B to part 136

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	94.8	80-120	80-120	50.0
1,2-Dichloroethane-d4	104.	70-121	70-121	50.0
Toluene-d8	96.7	81-117	81-117	50.0
4-Bromofluorobenzene	117.	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

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DEPARTMENT OF THE ARMY
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Environmental Chemistry Branch
Omaha Laboratory

VOA (Matrix Spike, Matrix Spike Duplicate) Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Analyzed:	12/23/03	Matrix:	Soil
Project Number:	7004	Date Reported:	01/06/04	Units:	ug/kg
Sample ID:	M031334-007			% Solids:	92.4
MS Sample ID:	WG14167-4				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	Sample Result	MS Conc	MS %Rec	QC Limits	MSD Conc	MSD %Rec	RPD (%)	QC Limits
75-71-8	Dichlorodifluoromethane	u	41.5	77.0	50-150	57.1	107	32. *	25
74-87-3	Chloromethane	u	47.0	87.2	50-150	58.6	109	23.	25
75-01-4	Vinyl Chloride	u	43.5	80.7	50-150	55.3	103	24.	25
74-83-9	Bromomethane	u	53.0	98.4	50-150	53.2	99.4	1	25
75-00-3	Chloroethane	u	55.1	102	50-150	59.7	111	9	25
75-69-4	Trichlorofluoromethane	u	49.2	91.2	50-150	47.7	89.1	2	25
67-64-1	Acetone	u	106	196 *	50-150	66.3	124	45. *	25
75-35-4	1,1-Dichloroethene	u	67.1	125	59-172	58.6	109	13.	25
75-09-2	Methylene Chloride	u	74.4	138	60-140	71.2	133	4	25
75-15-0	Carbon Disulfide	u	52.9	98.1	60-140	50.4	94.0	4	25
156-60-5	trans-1,2-Dichloroethene	u	62.0	115	60-140	54.0	101	13.	25
75-34-3	1,1-Dichloroethane	u	61.5	114	60-140	57.7	108	6	25
78-93-3	2-Butanone	u	95.1	177 *	50-140	67.3	126	34. *	25
594-20-7	2,2-Dichloropropane	u	58.4	108	60-140	53.7	100	8	25
156-59-2	cis-1,2-Dichloroethene	u	69.4	129	60-140	56.0	105	21.	25
67-66-3	Chloroform	u	61.2	113	60-140	58.0	108	5	25
74-97-5	Bromochloromethane	u	74.9	139	60-140	72.0	134	3	25
71-55-6	1,1,1-Trichloroethane	u	56.8	105	60-140	52.7	98.4	7	25
563-58-6	1,1-Dichloropropene	u	51.4	95.3	60-140	49.9	93.2	2	25
56-23-5	Carbon Tetrachloride	u	51.6	95.8	60-140	51.6	96.2	0	25
107-06-2	1,2-Dichloroethane	u	58.4	108	60-140	56.5	106	3	25
71-43-2	Benzene	u	55.6	103	66-142	53.3	99.4	4	25
79-01-6	Trichloroethene	u	56.6	105	62-137	57.0	106	1	25
78-87-5	1,2-Dichloropropane	u	53.4	99.1	60-140	54.0	101	2	25
75-27-4	Bromodichloromethane	u	53.8	99.8	60-140	51.9	96.9	3	25
74-95-3	Dibromomethane	u	60.8	113	60-140	60.0	112	0.7	25
108-10-1	4-Methyl-2-pentanone	u	58.4	108	50-150	48.0	89.5	19.	25
10061-01-5	cis-1,3-Dichloropropene	u	55.3	103	60-120	52.2	97.4	5	25
108-88-3	Toluene	u	48.4	89.8	59-139	44.4	82.9	8	25
10061-02-6	trans-1,3-Dichloropropene	u	56.8	105	50-150	52.9	98.8	7	25
591-78-6	2-Hexanone	u	43.6	80.9	60-140	34.2	63.8	24.	25
79-00-5	1,1,2-Trichloroethane	u	60.4	112	60-140	57.5	107	4	25
142-28-9	1,3-Dichloropropane	u	55.6	103	60-140	53.0	98.9	4	25
127-18-4	Tetrachloroethene	u	52.0	96.5	60-140	52.2	97.4	0.9	25
124-48-1	Dibromochloromethane	u	56.4	105	60-140	54.9	103	2	25
106-93-4	1,2-Dibromoethane	u	63.9	119	60-140	58.0	108	9	25
108-90-7	Chlorobenzene	u	50.2	93.2	60-133	48.7	91.0	2	25
100-41-4	Ethylbenzene	u	49.9	92.6	60-140	48.5	90.5	2	25
630-20-6	1,1,1,2-Tetrachloroethane	u	52.0	96.5	60-140	50.2	93.7	3	25
1330-20-7B	meta-/para-Xylenes	u	97.6	90.6	60-140	93.8	87.5	3	25
95-47-6	ortho-Xylene	u	50.0	92.8	60-140	49.6	92.5	0	25
100-42-5	Styrene	u	51.1	94.9	60-140	50.7	94.7	0	25
98-82-8	Isopropylbenzene	u	50.6	94.0	60-140	51.9	96.9	3	25
75-25-2	Bromoform	u	59.2	110	60-140	57.7	108	2	25
79-34-5	1,1,2,2-Tetrachloroethane	u	57.7	107	60-140	53.9	101	6	25
96-18-4	1,2,3-Trichloropropane	u	54.6	101	60-140	50.4	94.1	7	25
103-65-1	n-Propylbenzene	u	49.2	91.3	60-140	48.0	89.6	2	25

u: Below Sample Detection Limit (SDL >= MDL x Dilution)
 *: Indicates the value is outside control limits.
 %Rec: Percent of the spike recovered from the matrix

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VOA (Matrix Spike, Matrix Spike Duplicate) Report

Project Name: Nellis AFB - Hydrant Fuel System
Project Number: 7004
Sample ID: M031334-007
MS Sample ID: WG14167-4
Method: EPA 8260
Analyst: David Splichal

Date Analyzed: 12/23/03
Date Reported: 01/06/04

Matrix: Soil
Units: ug/kg
% Solids: 92.4

CAS Number	Compound	Sample Result	MS Conc	MS %Rec	QC Limits	MSD Conc	MSD %Rec	RPD (%)	QC Limits
108-86-1	Bromobenzene	u	51.7	95.9	60-140	50.4	94.0	2	25
108-67-8	1,3,5-Trimethylbenzene	u	50.8	94.2	60-140	49.9	93.2	1	25
95-49-8	2-Chlorotoluene	u	51.7	96.0	60-140	48.4	90.4	6	25
106-43-4	4-Chlorotoluene	u	54.5	101	60-140	52.9	98.7	2	25
98-06-6	tert-Butylbenzene	u	49.6	92.1	60-140	48.3	90.2	2	25
95-63-6	1,2,4-Trimethylbenzene	u	51.7	95.9	60-140	49.7	92.8	3	25
135-98-8	sec-Butylbenzene	u	52.2	96.9	60-140	50.5	94.2	3	25
99-87-6	p-Isopropyltoluene	u	50.7	94.1	60-140	48.3	90.2	4	25
541-73-1	1,3-Dichlorobenzene	u	55.0	102	60-140	51.0	95.2	7	25
106-46-7	1,4-Dichlorobenzene	u	56.4	105	60-140	52.5	98.1	6	25
104-51-8	n-Butylbenzene	u	54.1	100	60-140	52.8	98.5	2	25
95-50-1	1,2-Dichlorobenzene	u	56.4	105	60-140	54.2	101	3	25
96-12-8	1,2-Dibromo-3-chloropropane	u	65.7	122	60-140	61.5	115	6	25
120-82-1	1,2,4-Trichlorobenzene	u	60.6	112	60-140	61.9	116	3	25
87-68-3	Hexachlorobutadiene	u	51.2	95.1	60-140	55.9	104	9	25
91-20-3	Naphthalene	u	55.5	103	60-140	57.7	108	5	25
87-61-6	1,2,3-Trichlorobenzene	u	54.0	100	60-140	59.4	111	10.	25

%Rec: Percent of the spike recovered from the matrix
u: Below Sample Detection Limit (SDL >= MDL x Dilution)

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard Name	Added (ug/kg)	MS (ug/kg)	MS Rec (%)	MSD (ug/kg)	MSD Rec (%)	ECB Lab %Rec Limits	Method 8260 Acceptance Range	RPD (%)	ECB Lab RPD Limits
Dibromofluoromethane	50.0	55.6	111.	56.2	112.	80-120	80-120	1.	25
1,2-Dichloroethane-d4	50.0	55.8	112.	56.7	113.	70-121	70-121	2.	25
Toluene-d8	50.0	48.5	97.1	50.4	101.	81-117	81-117	4.	25
4-Bromofluorobenzene	50.0	49.9	99.7	52.0	104.	74-121	74-121	4.	25

(ECB Laboratory performance ranges are based on in-house testing.)

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VOA (Laboratory Control Sample) Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Analyzed:	12/24/03	Matrix:	Soil
Project Number:	7004	Date Reported:	01/06/04	Units:	ug/kg
LCS ID:	WG14167-2				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	LCS Result	Spike Added	LCS %Rec	Acceptance Range
75-71-8	Dichlorodifluoromethane	51.1	50.0	102	50-150
74-87-3	Chloromethane	51.1	50.0	102	50-150
75-01-4	Vinyl Chloride	51.1	50.0	102	50-150
74-83-9	Bromomethane	50.8	50.0	102	50-150
75-00-3	Chloroethane	50.7	50.0	101	50-150
75-69-4	Trichlorofluoromethane	50.3	50.0	101	50-150
67-64-1	Acetone	44.7 J	50.0	89.3	50-150
75-35-4	1,1-Dichloroethene	49.8	50.0	99.5	59-172
75-09-2	Methylene Chloride	53.7	50.0	107	60-140
75-15-0	Carbon Disulfide	44.8	50.0	89.5	60-140
156-60-5	trans-1,2-Dichloroethene	48.0	50.0	95.9	60-140
75-34-3	1,1-Dichloroethane	52.1	50.0	104	60-140
78-93-3	2-Butanone	50.1	50.0	100	50-140
594-20-7	2,2-Dichloropropane	49.8	50.0	99.6	60-140
156-59-2	cis-1,2-Dichloroethene	50.2	50.0	100	60-140
67-66-3	Chloroform	53.2	50.0	106	60-140
74-97-5	Bromochloromethane	57.7	50.0	115	60-140
71-55-6	1,1,1-Trichloroethane	53.5	50.0	107	60-140
563-58-6	1,1-Dichloropropene	49.9	50.0	99.8	60-140
56-23-5	Carbon Tetrachloride	52.4	50.0	105	60-140
107-06-2	1,2-Dichloroethane	50.3	50.0	101	60-140
71-43-2	Benzene	50.3	50.0	101	66-142
79-01-6	Trichloroethene	53.6	50.0	107	62-137
78-87-5	1,2-Dichloropropane	49.1	50.0	98.2	60-140
75-27-4	Bromodichloromethane	48.9	50.0	97.7	60-140
74-95-3	Dibromomethane	52.1	50.0	104	60-140
108-10-1	4-Methyl-2-pentanone	43.0 J	50.0	85.9	50-150
10061-01-5	cis-1,3-Dichloropropene	47.4	50.0	94.8	60-120
108-88-3	Toluene	44.1	50.0	88.2	59-139
10061-02-6	trans-1,3-Dichloropropene	46.0	50.0	92.1	50-150
591-78-6	2-Hexanone	38.6 J	50.0	77.1	60-140
79-00-5	1,1,2-Trichloroethane	47.3	50.0	94.7	60-140
142-28-9	1,3-Dichloropropane	44.8	50.0	89.7	60-140
127-18-4	Tetrachloroethene	47.5	50.0	95.1	60-140
124-48-1	Dibromochloromethane	47.3	50.0	94.6	60-140
106-93-4	1,2-Dibromoethane	48.9	50.0	97.8	60-140
108-90-7	Chlorobenzene	45.1	50.0	90.2	60-133
100-41-4	Ethylbenzene	45.6	50.0	91.1	60-140
630-20-6	1,1,1,2-Tetrachloroethane	48.4	50.0	96.8	60-140
1330-20-7B	meta-/para-Xylenes	92.5	100	92.5	60-140
95-47-6	ortho-Xylene	48.2	50.0	96.5	60-140
100-42-5	Styrene	47.5	50.0	94.9	60-140
98-82-8	Isopropylbenzene	49.9	50.0	99.7	60-140
75-25-2	Bromoform	51.4	50.0	103	60-140
79-34-5	1,1,2,2-Tetrachloroethane	43.1	50.0	86.2	60-140
96-18-4	1,2,3-Trichloropropane	40.0	50.0	80.0	60-140
103-65-1	n-Propylbenzene	42.1	50.0	84.2	60-140
108-86-1	Bromobenzene	43.1	50.0	86.3	60-140
108-67-8	1,3,5-Trimethylbenzene	42.5	50.0	85.1	60-140

J: Estimated Concentration below laboratory reporting limit.

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DEPARTMENT OF THE ARMY
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Environmental Chemistry Branch
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VOA (Laboratory Control Sample) Report

Project Name:	Nellis AFB - Hydrant Fuel System	Date Analyzed:	12/24/03	Matrix:	Soil
Project Number:	7004	Date Reported:	01/06/04	Units:	ug/kg
LCS ID:	WG14167-2				
Method:	EPA 8260				
Analyst:	David Splichal				

CAS Number	Compound	LCS Result	Spike Added	LCS %Rec	Acceptance Range
95-49-8	2-Chlorotoluene	40.7	50.0	81.4	60-140
106-43-4	4-Chlorotoluene	43.2	50.0	86.5	60-140
98-06-6	tert-Butylbenzene	45.4	50.0	90.9	60-140
95-63-6	1,2,4-Trimethylbenzene	43.3	50.0	86.6	60-140
135-98-8	sec-Butylbenzene	45.9	50.0	91.8	60-140
99-87-6	p-Isopropyltoluene	44.2	50.0	88.5	60-140
541-73-1	1,3-Dichlorobenzene	44.1	50.0	88.1	60-140
106-46-7	1,4-Dichlorobenzene	44.8	50.0	89.7	60-140
104-51-8	n-Butylbenzene	44.9	50.0	89.8	60-140
95-50-1	1,2-Dichlorobenzene	45.3	50.0	90.5	60-140
96-12-8	1,2-Dibromo-3-chloropropane	48.3	50.0	96.5	60-140
120-82-1	1,2,4-Trichlorobenzene	45.3	50.0	90.6	60-140
87-68-3	Hexachlorobutadiene	51.3	50.0	103	60-140
91-20-3	Naphthalene	46.0	50.0	92.1	60-140
87-61-6	1,2,3-Trichlorobenzene	44.3	50.0	88.7	60-140

Method Quality Control (Surrogate recoveries unadjusted for percent solids)

Surrogate Standard	Recovery (%)	ECB Lab Performance Range	Method 8260 Acceptance Range	Spike (ug/kg)
Dibromofluoromethane	103.	80-120	80-120	50.0
1,2-Dichloroethane-d4	101.	70-121	70-121	50.0
Toluene-d8	99.8	81-117	81-117	50.0
4-Bromofluorobenzene	88.0	74-121	74-121	50.0

(ECB Laboratory performance ranges are based on in-house testing.)

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DEPARTMENT OF THE ARMY
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Omaha Laboratory

Sample Report

Project Name: Nellis AFB - Hydrant Fuel Syst
Project Number: 7004
Client Sample ID: NS03-03-06
CQAB Sample ID : M031334-001

Date Sampled: 12/12/03
Date Received: 12/15/03
Date Reported: 12/19/03

Matrix: Soil
Units: mg/kg
Sample Amount: 25.3 g
% Solids: 89.3

Analyst: Woster
Method: SW846 8015B

Date Extracted: 12/16/03
Date Analyzed : 12/18/03

Dilution Factor: 1
Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	11	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control

Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	94	46-150	200

Method Blank : WG14137-1
Matrix Spike : WG14137-4

Laboratory Duplicate : WG14137-3
Matrix Spike Duplicate : WG14137-5

CZP

DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

Sample Report

Project Name: Nellis AFB - Hydrant Fuel Syst	Date Sampled: 12/12/03	Matrix: Soil
Project Number: 7004	Date Received: 12/15/03	Units: mg/kg
Client Sample ID: NS03-09-06	Date Reported: 12/19/03	Sample Amount: 25.1 g
CQAB Sample ID : M031334-002		† Solids: 86.4

Analyst: Woster	Date Extracted: 12/16/03	Dilution Factor: 1
Method: SW846 8015B	Date Analyzed : 12/18/03	Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	12	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control

Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	86	46-150	200

Method Blank : WG14137-1
Matrix Spike : WG14137-4

Laboratory Duplicate : WG14137-3
Matrix Spike Duplicate : WG14137-5

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DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

Sample Report

Project Name: Nellis AFB - Hydrant Fuel Syst	Date Sampled: 12/12/03	Matrix: Soil
Project Number: 7004	Date Received: 12/15/03	Units: mg/kg
Client Sample ID: NS03-08-06	Date Reported: 12/19/03	Sample Amount: 25.0 g
CQAB Sample ID : M031334-003		† Solids: 82.4
Analyst: Woster	Date Extracted: 12/16/03	Dilution Factor: 1
Method: SW846 8015B	Date Analyzed : 12/18/03	Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	12	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control			
Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	87	46-150	200

Method Blank : WG14137-1
Matrix Spike : WG14137-4

Laboratory Duplicate : WG14137-3
Matrix Spike Duplicate : WG14137-5

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DEPARTMENT OF THE ARMY
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Sample Report

Project Name: Nellis AFB - Hydrant Fuel Syst	Date Sampled: 12/12/03	Matrix: Soil
Project Number: 7004	Date Received: 12/15/03	Units: mg/kg
Client Sample ID: NS03-07-06	Date Reported: 12/19/03	Sample Amount: 25.1 g
CQAB Sample ID : M031334-004		% Solids: 81.3

Analyst: Woster	Date Extracted: 12/16/03	Dilution Factor: 1
Method: SW846 8015B	Date Analyzed : 12/18/03	Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	12	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control			
Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	83	46-150	200

Method Blank : WG14137-1	Laboratory Duplicate : WG14137-3
Matrix Spike : WG14137-4	Matrix Spike Duplicate : WG14137-5

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DEPARTMENT OF THE ARMY
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Sample Report

Project Name: Nellis AFB - Hydrant Fuel Syst	Date Sampled: 12/13/03	Matrix: Soil
Project Number: 7004	Date Received: 12/15/03	Units: mg/kg
Client Sample ID: NS03-05-06	Date Reported: 12/19/03	Sample Amount: 25.6 g
CQAB Sample ID : M031334-005		% Solids: 91.2
Analyst: Woster	Date Extracted: 12/16/03	Dilution Factor: 1
Method: SW846 8015B	Date Analyzed : 12/18/03	Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	11	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control			
Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	80	46-150	200

Method Blank : WG14137-1
Matrix Spike : WG14137-4

Laboratory Duplicate : WG14137-3
Matrix Spike Duplicate : WG14137-5

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DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

Sample Report

Project Name: Nellis AFB - Hydrant Fuel Syst	Date Sampled: 12/13/03	Matrix: Soil
Project Number: 7004	Date Received: 12/15/03	Units: mg/kg
Client Sample ID: NS03-06-06	Date Reported: 12/19/03	Sample Amount: 24.8 g
CQAB Sample ID : M031334-006		% Solids: 88.2
Analyst: Woster	Date Extracted: 12/16/03	Dilution Factor: 1
Method: SW846 8015B	Date Analyzed : 12/19/03	Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	11	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control			
Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	72	46-150	200

Method Blank : WG14137-1	Laboratory Duplicate : WG14137-3
Matrix Spike : WG14137-4	Matrix Spike Duplicate : WG14137-5

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DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

Sample Report

Project Name: Nellis AFB - Hydrant Fuel Syst	Date Sampled: 12/13/03	Matrix: Soil
Project Number: 7004	Date Received: 12/15/03	Units: mg/kg
Client Sample ID: NS03-04-06	Date Reported: 12/19/03	Sample Amount: 25.4 g
CQAB Sample ID : M031334-007		% Solids: 92.4
Analyst: Woster	Date Extracted: 12/16/03	Dilution Factor: 1
Method: SW846 8015B	Date Analyzed : 12/19/03	Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	11	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control

Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	79	46-150	200

Method Blank : WG14137-1
Matrix Spike : WG14137-4

Laboratory Duplicate : WG14137-3
Matrix Spike Duplicate : WG14137-5

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DEPARTMENT OF THE ARMY
Corps of Engineers
Environmental Chemistry Branch
Omaha Laboratory

Sample Report

Project Name: Nellis AFB - Hydrant Fuel Syst	Date Sampled: 12/13/03	Matrix: Soil
Project Number: 7004	Date Received: 12/15/03	Units: mg/kg
Client Sample ID: NS03-01-06	Date Reported: 12/19/03	Sample Amount: 25.4 g
CQAB Sample ID : M031334-008		% Solids: 88.5
Analyst: Woster	Date Extracted: 12/16/03	Dilution Factor: 1
Method: SW846 8015B	Date Analyzed : 12/19/03	Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	11	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control			
Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	83	46-150	200

Method Blank : WG14137-1	Laboratory Duplicate : WG14137-3
Matrix Spike : WG14137-4	Matrix Spike Duplicate : WG14137-5

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DEPARTMENT OF THE ARMY
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Chemistry Quality Assurance Branch
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Method Blank Report

Method Blank Sample ID: WG14137-1	Date Reported: 12/19/03	Matrix: Soil Units: mg/kg
Analyst: Woster Method: SW846 8015B	Date Extracted: 12/16/03 Date Analyzed: 12/18/03	Dilution Factor: 1 Batch ID: WG14137

CAS Number	Target Analyte	Result	Sample Reporting Limit	Sample Detection Limit
68476-30-2	DIESEL	u	10	3

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

Quality Control			
Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	98	46-150	200

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C34

DEPARTMENT OF THE ARMY
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Environmental Chemistry Branch
Omaha Laboratory

Laboratory Matrix Duplicate Report

LD Sample ID: WG14137-3	Date Reported: 12/19/03	Matrix: Soil
Sample ID: M031334-008		Units: mg/kg
		Sample Amount: 24.8 g
		% Solids: 88.5

Analyst: Woster	Date Extracted: 12/16/03	Batch ID: WG14137
Method: SW846 8015B	Date Analyzed: 12/18/03	Dilution Factor: 1

CAS Number	Target Analyte	Sample Result	LD Result	Sample Reporting Limit	Sample Detection Limit	RPD	QC Limits
68476-30-2	DIESEL	u	u	11	3	NC	33

u: Compound was analyzed for but not detected at or above the sample reporting limit
 NC: Not Calculable

Laboratory Comments:

$$RPD = (|Sample\ Result - LD\ Result| \times 100) / ((Sample\ Result + LD\ Result) / 2)$$

Surrogate Standard	Recovery (%)		Acceptable	Spike (mg/kg)	RPD	QC Limits
	Sample	LD				
PENTACOSANE	83	94	46-150	200	13	33

035

DEPARTMENT OF THE ARMY
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Environmental Chemistry Branch
Omaha Laboratory

Matrix Spike/Matrix Spike Duplicate Report

MS Sample ID: WG14137-4
MSD Sample ID: WG14137-5
Sample ID: M031334-005
Date Reported: 12/19/03
Matrix: Soil
Units: mg/kg
% Solids: 91.2

Analyst: Woster
Method: SW846 8015B
Date Extracted: 12/16/03
Date Analyzed: 12/18/03
Batch ID: WGL4137

CAS Number	Target Analyte	Sample Result	Spike Added	Conc MS	%Rec MS	QC Limits	Conc MSD	%Rec MSD	RPD	RPD Limits
68476-30-2	DIESEL	u	88	76	86	53-121	76	86	0	33

u: Compound was analyzed for but not detected at or above the sample reporting limit

Laboratory Comments:

RPD = (|MS Result - MSD Result| x 100)/((MS Result + MSD Result)/2)
Normal sample amount is 25 g.

Quality Control						
Surrogate Standard	Recovery (%)		Acceptable	Spike (mg/kg)	RPD	QC Limits
	MS	MSD				
PENTACOSANE	96	95	46-150	200	0.6	33

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C3p

DEPARTMENT OF THE ARMY
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Laboratory Control Sample Report

LCS ID: WG14117-2 Date Reported: 12/19/03 Matrix: Soil
Units: mg/kg

Analyst: Woster Date Extracted: 12/16/03 MOD 8015
Method: SW846 8015B Date Analyzed: 12/18/03
Batch ID: WG14117

CAS Number	Compound	Result	True Value	Sample Detection Limit	Sample Reporting Limit	Rec	Acceptance Limits (%)
68476-30-2	DIESEL	61	78	3	9.8	78	53-121

Laboratory Comments:

Quality Control

Surrogate Standard	Recovery (%)	Acceptable	Spike (mg/kg)
PENTACOSANE	97	46-150	200

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AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES 1
2. AMENDMENT/MODIFICATION NO. 05	3. EFFECTIVE DATE 2 February 2004	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)	
6. ISSUED BY U.S. Army Corps of Engineers Los Angeles District P.O. Box 532711 Los Angeles, CA 90053-2325	CODE	7. ADMINISTERED BY (If other than Item 6) Nellis AFB Residence Office Los Angeles District, U.S. Army Corps of Engineers Nellis AFB, 89191-0744	CODE CESPL-CO-AV	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)			(√)	9A. AMENDMENT OF SOLICITATION NO. W912PL-04-R-0003
			X	9B. DATED (SEE ITEM 11) 17 December 2003
				10A. MODIFICATION OF CONTRACTS/ORDER NO.
				10B. DATED (SEE ITEM 13)
CODE	FACILITY CODE			

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

<input checked="" type="checkbox"/>	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
See Continuation Page (Page 2).

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)	16C. DATE SIGNED

Type III Hydrant Fueling System, Nellis AFB, NV
Amendment of Solicitation Continuation

1. Section 00600 has been revised. The NAICS code has been corrected to 237120 and the Small Business Size standard to \$28,500,000. See clause 52.219-1.
2. Section 00110 has been revised to adjust the qualifications of personnel for Tab 2, "Offeror's Key Personnel Qualifications and Construction Experience" (paragraph 2.1.2).
3. The Nellis AFB Contamination Report is attached, file name "CNTMN_5.pdf).
4. The most recent Davis Bacon Wage Rate Determination dated 1/23/2004 replaces the previous Wage Rates. Section 00850 has been revised.
5. Section 08331A, Delete specification Section 08331A, Metal Rolling Counter Doors, in its entirety.
6. Section 02763A; Insert Paragraph 3.3.3. to read as follows:

"The Contractor shall replace all pavement markings disturbed during demolition of apron or road pavement. Markings shall match the demolished markings".

7. Section 15899; Add the following sentences to the end of paragraph 3.6.:

"During the time period of final performance testing, no construction activities will be allowed on the project site. The project site shall be considered an operational (fuel) zone (versus a construction zone) during this final performance-testing period. Personnel, dressed for fuel's operation, will be present to witness testing and participate in Contractor provided training."

8. Section 16375; paragraph 2.8.1.3, line 12, Three-Phase capacity. Delete "300 kVA" and substitute "750 kVA".
9. Section 01355A; paragraph 3.14.3., revise this paragraph number to 3.14.4.
10. Section 01355A; insert new paragraph 3.14.3 to read as follows:

"3.14.3 Drill Cuttings

Drill mud and cuttings generated during installation of the deep anode bed shall be stored in Contractor provided water tight roll-off bins at the drilling site. Ample time shall then be provided such the material dries in the sun to a near solid state. Contractor shall then contact Mr. DJ Haarklau at 702-652-6115 who will collect composite samples for analytical testing. Following sampling, Contractor shall haul solids to Las Vegas Paving (approximately 7 mile haul distance) for ultimate disposal. Contractor shall coordinate delivery of solids with Mr. Haarklau and Mr. Dave Breault of Las Vegas Paving at 702-649-7423. Disposal costs shall be paid by the Base.

Type III Hydrant Fueling System, Nellis AFB, NV

Amendment of Solicitation Continuation

11. Drawings (Reissued). The following sheets are revised with latest revision date of 28 January 2004, and reissued with this amendment.

- a. Sheet EC.01 Cathodic Protection Details;
- b. Sheet C4.26 Site Paving Details 6;
- c. Sheet EU.5 Composite Site Plan – Area 3; and
- d. Sheet EC.04 Cathodic Protection Details.

NOTE: The reissued drawings above refer to Amendment 04; however, for clarity, they actually refer to Amendment 05.

Type III Hydrant Fueling System
Nellis AFB, NV

SECTION 00110
PROPOSAL SUBMISSION, EVALUATION, AND CONTRACT AWARD

1. PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS

If you do not want the data submitted by your firm disclosed by the Government, follow the procedure specified in Section 00100, INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS, Clause 52.215-1, "Instructions to Offerors — Competitive Acquisitions," subparagraph (e) "Restriction on Disclosure and Use of Data."

All proposals submitted will become, upon receipt, the property of the U.S. Government and will not be returned. If the Offeror desires to withdraw or modify its proposal, it may do so in accordance with Section 00100, INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS, Clause 52.215-1, Instructions to Offerors – Competitive Acquisitions," subparagraph (c) "Submission, modification, revision, and withdrawal of proposals."

1.1 SIZE OF PRINTED MATTER SUBMISSIONS

All written portions shall be submitted in standard letter **8-1/2" x 11" format**.

1.2 WHERE TO SUBMIT

Offerors shall submit their proposal packages to the USACE Contracting Activity at the address shown in Block 8 of Standard Form 1442. Note the address for delivery of hand-carried proposals provided in the Section 00100.

Proposal shall be submitted in a separate envelope/package with the type of proposal (i.e., Technical or Price) clearly printed on the outside of the envelope or package.

1.3 SUBMISSION DEADLINE

Proposals shall be received by the USACE Contracting Activity no later than the time and date specified in Block 13 of Standard Form 1442 or as amended in Standard Form 30. For hand-delivered proposals, refer to Section 00100, paragraph 52.215-4009, of the Specifications for access procedures.

On the date specified and for thirty (30 minutes) prior to time specified on the Standard Form SF 1442 or Standard Form 30, a Contracting Representative will be in the USACE, L.A. District Public Affairs Office, Suite 980, 915 Wilshire Blvd., Los Angeles to receive proposals. At the time specified, it will be announced that receipt of proposals is closed. Official time will be established by time/stamp clock located in the area where proposals are received. Proposals received after the established date and time will not be considered.

1.4 PROPOSAL FORMAT

All proposals shall contain the evaluation requirements stated herein and every 3-ring binder shall contain: Cover Letter, Table of Contents, List of Tables (if required), List of Figures (if required), List of Appendices, and Name/Address/Telephone Number of the Offeror. Contents of the binders shall be tabbed and labeled to afford easy identification. The contents shall follow the order of the evaluation criteria and all pages shall be numbered consecutively. Proposal clarity, organization (as requested in this solicitation) and cross-referencing are mandatory. The Technical proposal (Tabs 1 through 3 listed below) shall be presented in a manner, which allows it to "STAND ALONE." No material (information not part of

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proposal) shall be incorporated by reference. Proposal organization must be easy to follow. Offeror submitting proposals shall limit submission to data essential for evaluation of proposals so that a minimum of time and monies are expended in preparing information required by the Request for Proposal (RFP). Elaborate artwork, expensive paper and bindings, and expensive visual and other presentation aids are neither necessary nor wanted. The offeror's name, address, signature, and telephone number shall be included on the cover letter of the submittal to be evaluated. Offeror shall submit the **original and three (3)** copies of their proposal, each consisting of a 3-ring binder with Tabs (dividers) separating the sections as specified below.

Organization of Tabs

Volume 1

Tab 1 – Contractor Construction Experience

Tab 2 - Offeror's Key Personnel Qualifications and Construction Experience

Tab 3 - Offeror's Subcontractors Qualifications and Construction Experience

Tab 4 - Technical Past Performance Minimum Requirements

Tab 5 - Required Information

Tab 6 –Subcontracting Plan (Large Business Only)

Volume 2

Tab 1 – Price

Tab 2 – Representations and Certifications (Section 00600) and Certificate of Corporate Principal (part of Section 00BSN, Offeror's Notes)

Tab 3 – Pre-Award Survey Information (including bid bond)

1.5 Multiple Subcontractors:

If more than one firm is under consideration for a key subcontracted feature, identify each firm. If more than one firm will perform work on a subcontracted feature, explain the roles of each firm and specific items of work they will perform. If multiple subcontractors are provided and any are determined unacceptable, then the proposal will be rated lower.

1.6 Joint Ventures:

No contract may be awarded to a joint venture that is not registered in the Central Contractor Register (CCR).

2. PROPOSAL SUBMITTALS

The requirements specified in the solicitation are considered minimum requirements. Proposal clarity, organization (as defined in this solicitation) and cross referencing are mandatory. Submitted material incorporated by reference will not be evaluated. The offeror should submit in the proposal the requested information specified below. All non-price factors (technical factors) are approximately equal to each other in importance. **All evaluation factors other than price, when combined, are approximately equal to price.** **The Government is concerned with striking the most advantageous balance between technical merit ("quality") and cost to the Government (i.e., the price). The degree of importance of price could become greater depending upon the equality of the technical proposals. If competing technical proposals are determined to be essentially equal, price could become the controlling factor.** An unacceptable evaluation rating for any tab, or combination of unacceptable ratings of different tabs, may cause the proposal to be evaluated overall as unacceptable. Price (Tab 1, Volume 2) will be evaluated in accordance the requirements listed in paragraph 3.0 below.

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VOLUME 1

2.1 QUALIFICATIONS AND EXPERIENCE

The Government reserves the right to consider all aspects of the experience of the offeror’s key personnel to include what is detailed below:

2.1.1 Tab 1 - Contractor Construction Experience.

Specifically including work performed that is similar in nature, magnitude, and complexity to the work described in this solicitation (i.e. hydrant fuel construction on a completed system and successful start-up of a military or civilian Hydrant Fueling System with features such as a 2400 gpm pumphouse, hydrant control pits, and an above-ground fuel storage tank with fixed roof and floating pans in the range of \$5,000,000 to \$15,000,000 or higher. Include the following information:

Project Title & Location
Project Type (e.g., design-build (DB), design (D), construction (C))
Dollar Value (design \$; construction \$)
Start & Completion Dates (Month/Year)
Role of Firm(s) (e.g., prime, sub) (address type of work performed and percentage of work, as applicable)
Brief Description of Project (address how this relates to solicitation project)
Customer Point of Contact (i.e., name, relationship to project, agency/firm affiliation, city, state, current phone no.)
Awards or recognition received (if applicable)
Firms on the proposed team that performed this project

2.1.2 Tab 2 - Offeror’s Key Personnel Qualifications and Construction Experience:

The Offeror must demonstrate specific project experience (minimum of one project, similar to this project, within the last 5 years) of each of its Key Personnel (Construction Project Manager, Project Superintendent and Contractor Quality Control (CQC) System Manager) that are assigned to this project. The offeror should submit the names and resumes for key construction personnel that will be assigned to this project. In addition, provide a summary of the duties and responsibilities of these individuals that clearly indicate separate duties and responsibilities for each individual. Note that each of the listed personnel must have separate and distinct responsibilities – no single person may perform the duties of more than one position. The proposal should clearly present the credentials of each person and show that each meets the requirements listed below. Each resume should include examples of project experience (including what capacity the individual served on each project), as well as the dates (month and year) employed on each project in that capacity, and the monetary size of each project cited as experience. Resumes should be listed in reverse chronological order, with the latest experience listed first, and all time gaps on each resume fully explained. In addition, the educational qualifications of the proposed personnel should be submitted. As a minimum, the following information showing similar experience of its Key Personnel for each project shall be provided:

- a. Name, Assigned Position, and Company this Key Person Worked for,
- b. Project title and location,

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- c. Dollar value of construction,
- d. Construction period (month/year start to month/year end),
- e. Brief description of how the project meets the requirements of this criterion, and
- f. Current primary POC for the customer (name, relationship to project, agency/firm affiliation, city and state, and phone number).

Offerors must provide documentation that demonstrates compliance with required qualifications of the proposed Construction Project Manager, Project Superintendent, and Contractor Quality Control (CQC) System Manager. This documentation may include resumes or other statements demonstrating the experience of these individuals. For project experience, listed under qualifications, provide the same information as described in 2.1.2 above.

Construction Project Manager.

The proposed Construction Project Manager shall possess a Bachelor's Degree in Engineering or Sciences, with a minimum of 5 years experience in Construction Project Management. A minimum of 2 of those 5 years as experience in construction related to the installation of Hydrant Fueling System for completed systems.

Contractor Quality Control (CQC) System Manager.

The CQC System Manager must be either:

Possess a Bachelor's Degree in Engineering or Sciences with a minimum of 2 years experience in construction related to the installation of Hydrant Fueling System for completed systems.

Have a minimum of 8 years construction experience as a Construction CQC or Superintendent with a minimum of 2 of those 8 years as experience in construction related to the installation of Hydrant Fueling System for completed systems.

On-Site Project Superintendent.

The proposed On-Site Project Superintendent shall have a minimum of 5 years construction related experience as a superintendent on industrial construction projects with a minimum of 2 of those 5 years as construction related experience with the installation of Hydrant Fueling Systems.

2.1.3 Tab 3 - Offeror's Subcontractors Qualifications and Construction Experience:

Provide examples of construction projects similar to that described in this RFP in which these subcontractor(s) have been involved. Project examples must be similar to those required in paragraph 2.1.2 above. In lieu of "Name, Assigned Position, and Company this Key Person Worked for", substitute "Name of Subcontractor". Also, identify subcontractors' current key personnel (including their roles) involvement with the projects by name, or identify if the work is to be self-performed.

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2.1.3.1 Mechanical [Fuels]

2.1.3.2 Electrical [Class I, Division I Fuels Experience]

2.1.3.3 Steel Fabricator/Erector (Fuel Tank). Steel Fabricator/Erector (Fuel Tank) will be required to show that they have experience in construction of 5,000 barrel or larger fuel storage tanks (as a minimum)

2.1.3.4 Airfield Pavement: The contractor will be required to show that they have experience in construction of 13-inch thick Portland Cement Concert (PCC) (as a minimum).

2.1.3.5 System Supplier: The proposed system supplier/installer shall have been regularly engaged in Hydrant Fueling Systems installation work for at least 5 years. The Offeror shall provide a listing indicating that the system supplier has installed at least five similar Programmable Logical Controllers (PLC) based pump control systems for automatic cycling of pumps based upon varying dispensing demands utilizing multiple pumps for dispensing jet fuel into aircraft in the last 5-year period. The Offeror shall provide locations and dates for at least five of the listed systems that have successfully operated over the last three years and are still currently in service.

2.1.4 Tab 4 - Technical Past Performance Minimum Requirements:

The Offeror's past construction performance will be evaluated. The minimum requirements, which must be demonstrated in order for past performance to be acceptable include no overall "unsatisfactory" performance evaluations in Hydrant Fueling Systems in the last 5 years. Offerors must provide information on all Hydrant Fueling System work performed in the last five (5) years. Offeror shall not have received any overall "unsatisfactory" performance ratings in Hydrant Fueling Systems in the last 5 years. All Offeror must provide the following information on References to be contacted on your company:

2.1.4.1 Name and Fax number of Owner/User

2.1.4.2 Project Name, Location, Contract Number, and dollar value

2.1.4.3 Name and phone number of individuals (primary and alternate) that can verify performance on the project.

2.1.5 TAB 5 – Past Performance in Meeting Small Business and Small Disadvantaged Business (SDB) Goals (Large Businesses Only): This tab should include the following information for purposes of proposal evaluation:

a. Past Performance in Meeting Small Business Floors. Demonstrate how floors for Small Business participation were satisfied on previous contracts, extent to which the prime has historically been successful in establishing realistic yet challenging goals, and evidences the ability to achieve them. The Offeror should submit data on Past Performance in meeting small business goals which will demonstrate how goals for small business concerns participation on previous contracts was satisfied. The data to be provided should include: (1) Client/Customer (2) Contract/Identification Number (3) Project Description (4) Contract Amount (5) Goals established for that project (6) Actual percentages met for that contract (7) Reference or Point of Contract (to include address and telephone number).

b. Demonstrate utilization and participation of small business concerns, clearly stated factors that demonstrate strong commitments to use SB, SDB, WOSB, SDVSB, and HubZone as team members, subcontractors, and/or suppliers. The proposal should clearly state positive steps taken to demonstrate a strong commitment to use small business concerns. Enforceable commitments to use small business concerns will be weighed more heavily than non-enforceable ones.

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c. Description of supplies and services to be subcontracted and planned for subcontracting to SBs, SDBs, WOSBs, SDVSBs, and HUB-Zones.

Assurances that the offeror will include the clause at FAR 52.219-8, Utilization of Small Business Concerns in all subcontracts that offer further subcontracting opportunities, and that the offeror will require subcontractors (including small business concerns) that receive subcontracts in excess of \$500,000 (\$1,000,000 for construction) to adopt a small business participation program similar to the requirements of the resultant contract.

2.1.6 Tab 6 - Subcontracting Plan:

If your firm is a large business and your proposal **exceeds \$1,000,000** or more for construction, a Small Business Subcontracting Plan is required at the time your offer is submitted. A SAMPLE Small Business Subcontracting Plan is attached to this section of the solicitation. This plan is not a part of the technical evaluation. The plan will be reviewed for compliance with the established criteria in Appendix CC, which is attached to the section of the solicitation. The subcontracting plan must be approved prior to contract award. The Offeror should demonstrate, through submission of a Small Business Subcontracting Plan in accordance with FAR 52.219-9, how the firm plans to identify, commit and utilize Small Business (**SB**), Small Disadvantaged Business (**SDB**), HUB Zone Small Business, Women-owned Small Business (**WOSB**) concerns, Historical Black Colleges and Minority Institutions (**HBCU/MI**), Veteran Owned Small Businesses (**VOSB**), and Service Disabled Veteran Owned Businesses (**SDVOB**) concerns as team members, subcontractors and/or suppliers in the performance of the resultant contract of this solicitation. It is the policy of the U.S. Army Corps of Engineers, Los Angeles District (CESPL) that small business concerns have the maximum practicable opportunity to participate in performing contracts let by the Contracting Activity (CESPL-CT). It is further the policy of the CESPL that its prospective prime contractors, demonstrate the extent they plan to utilize small business concerns in any resultant contract and provide assurance in its offer that small business concerns will have maximum subcontracting opportunities in its prime contracts.

2.2 Definitions:

2.2.1.1 Small Business Concerns. For the purpose of this section, small business concerns refer to Small Business, Small Disadvantaged Business, Women-owned Small Business, HUB Zone Small Business, Service Disabled Veteran Owned Small Businesses and Historically Black College and University and Minority Institutions.

2.2.1.2 Prime Contractor. For the purpose of this section, a prime contractor refers to both large and small contractors.

2.2.1.3 Offeror: For the purpose of this section, Offeror refers to both large and small contractors.

2.2.1.4 Goal: For the purpose of this section, goal represents the minimum level for small business performance.

2.2.2 Development of Percentage Goals (Applicable to Large Business Only):

Development of percentage goals based on planned subcontracting that is challenging yet realistic. The following goals are considered reasonable and obtainable for requirements awarded in Fiscal Year 2003.

- 71.1% of planned subcontracting dollars to be placed with all small business (SB) concerns.
- 10.2% of planned subcontracting dollars to be placed with those small business concerns owned and controlled by socially and economically disadvantaged individuals (SDB).

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- 10.6% of planned subcontracting dollars to be placed with women-owned small business (WOSB) concerns.
- 3.0% of planned subcontracting dollars with Service Disabled Veterans Small Business (SDVB) concerns.
- 3.0% of planned subcontracting dollars with Veteran-Owned Small Businesses (VOSB)
- 3.0% of planned subcontracting dollars with Hubzones Small Business Concerns.

VOLUME 2

2.3 Price Proposal Submittal

The format of Tab 1, Volume 2 shall include what is detailed below.

2.3.1 TAB 1 - Section 00010, Solicitation/Contract Form and Pricing Schedule:

The total combined cost for the construction will be considered for award.

2.3.2 TAB 2 - Section 00600, Representations, Certifications and Other Statements of Offerors:

This item will not be considered for evaluation purposes, but is required to be completed and submitted with your offer. Also include the *Certificate of Corporate Principal from Section 00BSN*.

2.3.3 TAB 3 - Pre-Award Survey Information:

In accordance with FAR Clause 52.228-15 PERFORMANCE AND PAYMENT BONDS, request that the following information be submitted with your offer. This submittal facilitates the award process.

2.3.3.1 Financial:

- a. Name, address, and fax number of Financial Institution

2.3.3.2 b. Bid Bond and Name and phone number of finance individual (primary and alternate) to be contacted for information Bonding Information. Provide the name, address, regular phone number and fax number of your Surety Company.

3. EVALUATION

It is the intent of the Government to make award based upon initial offers, without further exchanges or additional information. A firm fixed-price contract will be awarded to the firm submitting the proposal that conforms to this request for proposals (RFP) and is determined to be in the best interest of the Government. All proposals received will be evaluated by a Source Selection Evaluation Board (SSEB) based on the factors stated in the solicitation to select the responsible Offeror whose proposal is most advantageous and offers the best value to the Government. Because of the number of solicitations requested, uniformity of all proposals is essential to assure fair and accurate evaluation. All proposals must comply with the instructions in the solicitation. The most highly rated proposals will make up the competitive range. (See FAR 15.306(c)(1)). Source selection will be conducted using the Tradeoff Process, FAR 15.101-1. Tabs 1 through 4 of Volume 1 will be rated using an adjectival method that includes a narrative assessment to identify strengths, weaknesses, and deficiencies of the proposed approach in each proposal. Price (Tab 1, Volume 2) will be evaluated for best value after consensus rating of Tabs 1 through 4. Large Businesses will be evaluated for Tabs 5 and 6 using an adjectival method that includes a narrative assessment to

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identify strengths, weaknesses, and deficiencies of the proposal. Proposal evaluation is an assessment of the proposal and the offeror's ability to perform the resultant contract successfully.

3.1 DEFINITIONS

3.1.1 Strength. A substantive aspect, attribute, or specific item in the proposal that exceeds the solicitation requirements and enhances the probability of successful contract performance.

3.1.2 Proposal modification is a change made to a proposal before the solicitation closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

3.1.3 Proposal revision is a change to a proposal made after the solicitation closing date, at the request of or as allowed by the contracting officer, as a result of negotiations.

3.1.4 Weakness. A flaw in the proposal that increases the risk of unsuccessful contract performance. A significant weakness in the proposal is a flaw that appreciably increases the risk of unsuccessful contract performance.

3.1.5 Deficiency. A material failure of a proposal to meet a Government requirement or a combination of significant weaknesses in a proposal that increases the risk of unsuccessful contract performance to an unacceptable level.

3.1.6 Clarification. Clarifications are limited exchanges between the Government and offerors that may occur when award without discussions is contemplated. If award without discussions is anticipated, offerors may be given the opportunity to clarify certain aspects of their proposals or to resolve minor or clerical errors without material changes to their proposal. The purpose of clarifications is the elimination of minor irregularities, informalities or apparent clerical mistakes in the technical proposal. Clarifications do not provide an offeror the opportunity to revise or modify its proposal, except for correction of apparent clerical mistakes that would ultimately result in a revision. All clarifications are conducted through the Contracting Officer.

3.1.7 Communications. Communications are exchanges between the Government and offerors after receipt of proposals, leading to establishment of the competitive range.

3.1.8 Discussions. Discussions are negotiations conducted in a competitive acquisition and take place after establishment of the competitive range. Discussions are tailored to each offeror's proposal, and shall be conducted by the Contracting Officer with each offeror within the competitive range.

3.1.9 Rating. The application of a scale of adjectives used in conjunction with narrative, to denote the degree to which the proposal has met the standard for a non-cost factor. For purposes of this solicitation, ratings will consist of words (adjectival method) used in conjunction with narratives. Ratings will be applied at the factor (tab) and sub-factor level. If at any level of indentation an Offeror's proposal is evaluated as not meeting a minimum requirement, this fact must be included in the rating and narrative. The following ratings will be used to evaluate Tabs 1 through 6:

3.1.9.1 Exceptional. Exceeds requirements of the RFP and provides all required information stated the solicitation, and is expressed in a manner indicating maximum benefit to the government. The submitted technical portion of the proposal has no significant weakness.

3.1.9.2 Above Average. Exceeds requirements of the RFP and provides all required information and is expressed in a manner indicating significant benefit to the government. The submitted proposal has only minor weaknesses that have no impact on the proposal as a whole and do not require correction.

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3.1.9.3 Average. Meets requirements of the RFP as required and indicates benefits to the government. Any weaknesses noted have only a minor impact on the proposal and are easily correctable.

3.1.9.4 Marginal. Barely meets solicitation requirements of the factor or sub-factor requirements of the solicitation. The Government may still receive benefit from the proposal submitted. Any deficiencies noted are correctable without major revision of the proposal.

3.1.9.5 Unacceptable. Fails to meet one or more of the factor or sub-factor requirements of the solicitation. The Government would not receive benefit from the proposal submitted. The deficiencies noted are uncorrectable without a major revision of the proposal

3.2 EVALUATION OF PRICING AND REVIEW OF SMALL BUSINESS SUBCONTRACTING PLAN

3.2.1 Pricing:

Price will be subjectively evaluated for Best Value, Reasonableness, and Realism by the Government taking into consideration the total cost of the basic and all option items.

3.2.1.1 Reasonableness:

Prices are reasonable when compared with the Government Estimate and other price proposals.

3.2.1.2 Realism:

Prices are compatible with the proposal scope and effort, and are realistic. For example: Prices are neither excessive nor insufficient for the effort to be accomplished.

3.2.1.3 Completeness:

All pricing information has been submitted and relates directly to the proposal requirements.

3.2.2 Review of Small Business Subcontracting Plan (LARGE BUSINESSES ONLY).

The plan will be reviewed for compliance with the established criteria in Section 00110 paragraph 2.2.2.

4. COMPETITIVE RANGE.

Upon completion of proposal evaluation, if discussions are needed, the Government may establish a competitive range for the purpose of conducting written discussion. The competitive range shall be determined on the basis of the factors stated in the solicitation and shall include all proposals that have a reasonable chance of being selected for award. **The Government intends to award a contract on the basis of initial offers received, without discussions.** Therefore, each initial offer should contain the offeror's best terms from a cost or price and technical standpoint. Notwithstanding, the Government may conduct written discussions with all responsible offerors who submit proposals and are considered within the competitive range. Offerors submitting proposals determined outside of the competitive range (lacking a reasonable chance of being selected for contract award) will be notified in writing at the earliest practicable time.

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FINAL PROPOSAL REVISIONS.

If discussions are held, upon their completion the Government shall issue to all Offerors within the competitive range a request for final proposal revisions specifying the exact date and time for submission of the revision. Any verbal revisions to proposals made during the course of discussions must be included in the offeror's written Final Revised Proposal. Any verbal revisions not included in the final revision will not be considered in re-evaluating the proposals. Any verbal request for a Final Revised Proposal shall be confirmed in writing. The confirmation shall include:

- (1) Notice that discussions are concluded.
- (2) Notice that this is the opportunity to submit a Final Revised Proposal.
- (3) Establishment of a common cutoff date and time that allows the offerors reasonable opportunity for submission of written Proposal revisions.
- (4) Notice that Proposal Revisions, and modifications thereto, must be received by the date, time, and in the place specified in the notice, or they are subject to the Late Offers provision in the solicitation in Section 00100.

Following the evaluation of final proposal revisions, the Government will select the offeror whose initial and final proposal revision presents the Best Value and is most advantageous, considering only the factors included in the solicitation, to the Government.

DEBRIEFING

Each offeror, successful or unsuccessful, will have the opportunity, in accordance with Federal Acquisition Regulation (FAR) 15.505 and 15.506, to receive one debriefing. Offerors are required to submit a written request for debriefing and discussion of the evaluation of its proposal within three (3) calendar days after receipt of notice of award. The debriefing of all offerors, successful or unsuccessful, will be conducted by the Contracting Officer in accordance with the FAR. Each offeror shall be provided only one debriefing, either post award or pre-award, at their choosing. The Contracting Specialist will coordinate and schedule the debriefings. Debriefing participation will include the Contracting Officer, chairperson of the SSEB, and Contracting Specialist with additional support from other members of the SSEB as required.

5. CONTRACT AWARD

Subject to provisions contained herein, award will be made to one Offeror. To be considered for award, proposals shall conform to the terms and conditions contained in the RFP. No proposal shall be accepted that does not comply with all technical requirements specified in this solicitation or which includes stipulations or qualifying conditions.

5.1 SELECTION AND AWARD WITHOUT EXCHANGES

It is the intent of the Government to make award based upon initial offers, without further exchanges or additional information. Therefore, proposals should be submitted initially on the most favorable terms from a price and minimum technical requirement. Do not assume an opportunity will be afforded to clarify, discuss, or revise proposals. If award is not made on initial offers, exchanges will be conducted as needed.

5.2 SELECTION AND AWARD WITH EXCHANGES

If exchanges are conducted, the Source Selection Evaluation Board (SSEB) will evaluate supplemental information provided by the Offeror and may adjust a proposal's acceptability as required. The SSEB will provide a list of the offers within the competitive range to the Source Selection Authority. Selection will be

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made on the basis of the responsible offer, conforming to the RFP, representing the most advantageous offer to the government, and subject to availability of funds.

5.3 PROPOSAL EXPENSES AND PRECONTRACT COSTS

This RFP does not commit the Government to pay costs incurred in preparation and submission of proposals or for any other costs incurred prior to execution of a formal contract.

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Section 00600 - Representations & Certifications

52.203-2 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION
(APR 1985)

(a) The offeror certifies that --

(a) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to -

(1) Those prices,

(i) The intention to submit an offer, or

(iii) The methods of factors used to calculate the prices offered:

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory --

(1) Is the person in the offeror's organization responsible for determining the prices offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision; or

(2) (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision

_____ (insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization);

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision.

(c) If the offeror deletes or modifies subparagraph (a)(2) of this

provision, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

(End of clause)

52.203-11 CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this Certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989,--

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(b) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

(End of provision)

52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

(a) Definitions.

Type III Hydrant Fueling System, Nellis AFB, NV

"Common parent," as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Taxpayer Identification Number (TIN)," as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

TIN: _____

TIN has been applied for.

TIN is not required because:

Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

Offeror is an agency or instrumentality of a foreign government;

Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

Sole proprietorship;

Partnership;

Corporate entity (not tax-exempt);

Corporate entity (tax-exempt);

Government entity (Federal, State, or local);

___ Foreign government;

___ International organization per 26 CFR 1.6049-4;

___ Other _____

(f) Common parent.

___ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

___ Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) (MAY 1999)

(a) Definition. Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) Representation. [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program Representations, of this solicitation.] The offeror represents that it () is a women-owned business concern.

(End of provision)

52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that--

(i) The Offeror and/or any of its Principals--

(A) Are () are not () presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have () have not (), within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with

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obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are () are not () presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(B) of this provision.

(ii) The Offeror has () has not (), within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER SECTION 1001, TITLE 18, UNITED STATES CODE.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

52.215-6 PLACE OF PERFORMANCE (OCT 1997)

(a) The offeror or respondent, in the performance of any contract resulting from this solicitation, () intends, () does not intend (check applicable block) to use one or more plants or facilities located at a different address from the address of the offeror or respondent as indicated in this proposal or response to request for information.

(b) If the offeror or respondent checks "intends" in paragraph (a) of this provision, it shall insert in the following spaces the required information:

Place of Performance(Street Address, City, State, County, Zip Code)	Name and Address of Owner and Operator of the Plant or Facility if Other Than Offeror or Respondent

(End of provision)

52.215-7 ANNUAL REPRESENTATIONS AND CERTIFICATIONS--
NEGOTIATION (OCT 1997)

The offeror has (check the appropriate block):

_____ (a) Submitted to the contracting office issuing this solicitation, annual representations and certifications dated _____ (insert date of signature on submission) that are incorporated herein by reference, and are current, accurate, and complete as of the date of this proposal, except as follows [insert changes that affect only this proposal; if "none," so state]:

_____ (b) Enclosed its annual representations and certifications.

(End of provision)

52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (APR 2002)
- ALTERNATE I (APR 2002)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 237120.

(2) The small business size standard is \$28,500,000.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it () is, () is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror

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represents, for general statistical purposes, that it () is, () is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it () is, () is not a women-owned small business concern.

(4) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it () is, () is not a veteran-owned small business concern.

(5) (Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.) The offeror represents as part of its offer that it () is, () is not a service-disabled veteran-owned small business concern.

(6) [Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.] The offeror represents, as part of its offer, that--

(i) It () is, () is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It () is, () is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. (The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:_____.) Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) (Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision.) The offeror shall check the category in which its ownership falls:

___ Black American.

___ Hispanic American.

___ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

___ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of

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the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

___ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

___ Individual/concern, other than one of the preceding.

(c) Definitions. As used in this provision--

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern," means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

Veteran-owned small business concern means a small business concern--

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern," means a small business concern --

(1) That is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; or

(2) Whose management and daily business operations are controlled by one or more women.

(d) Notice.

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(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

52.219-19 Small Business Concern Representation for the Small Business Competitiveness Demonstration Program. (Oct 2000)

(a) *Definition.* "Emerging small business" as used in this solicitation, means a small business concern whose size is no greater than 50 percent of the numerical size standard applicable to the North American Industry Classification System (NAICS) code assigned to a contracting opportunity.

(b) [Complete only if the Offeror has represented itself under the provision at 52.219-1 as a small business concern under the size standards of this solicitation.] The Offeror is, or is not an emerging small business.

(c) [Complete only if the Offeror is a small business or an emerging small business, indicating its size range.]

Offeror's number of employees for the past 12 months [check this column if size standard stated in solicitation is expressed in terms of number of employees] or Offeror's average annual gross revenue for the last 3 fiscal years [check this column if size standard stated in solicitation is expressed in terms of annual receipts]. [Check one of the following.]

No. of Employees	Avg. Annual Gross Revenues
_____ 50 or fewer	_____ \$1 million or less
_____ 51 - 100	_____ \$1,000,001 - \$2 million

___ 101 - 250	___ \$2,000,001 - \$3.5 million
___ 251 - 500	___ \$3,500,001 - \$5 million
___ 501 - 750	___ \$5,000,001 - \$10 million
___ 751 - 1,000	___ \$10,000,001 - \$17 million
___ Over 1,000	___ Over \$17 million

52.219-22 SMALL DISADVANTAGED BUSINESS STATUS (OCT 1999)
ALTERNATE I (OCT 1998)

(a) General. This provision is used to assess an offeror's small disadvantaged business status for the purpose of obtaining a benefit on this solicitation. Status as a small business and status as a small disadvantaged business for general statistical purposes is covered by the provision at FAR 52.219-1, Small Business Program Representation.

(b) Representations.

(1) General. The offeror represents, as part of its offer, that it is a small business under the size standard applicable to this acquisition; and either--

___ (i) It has received certification by the Small Business Administration as a small disadvantaged business concern consistent with 13 CFR 124, Subpart B; and

(A) No material change in disadvantaged ownership and control has occurred since its certification;

(B) Where the concern is owned by one or more disadvantaged individuals, the net worth of each individual upon whom the certification is based does not exceed \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(C) It is identified, on the date of this representation, as a certifies small disadvantaged business concern in the database maintained by the Small Business Administration (PRO-Net); or

___ (ii) It has submitted a completed application to the Small Business Administration or a Private Certifier to be certified as a small disadvantaged business concern in accordance with 13 CFR 124, Subpart B, and a decision on that application is pending, and that no material change in disadvantaged ownership and control has occurred since its application was submitted.

(2)___ For Joint Ventures. The offeror represents, as part of its offer, that it is a joint venture that complies with the requirements at 13 CFR 124.1002(f) and that the representation in paragraph (b)(1) of this provision is accurate for the small disadvantaged business concern that is participating in the joint venture. [The offeror shall

enter the name of the small disadvantaged business concern that is participating in the joint venture: _____.]

(3) Address. The offeror represents that its address_____is, _____is not in a region for which a small disadvantaged business procurement mechanism is authorized and its address has not changed since its certification as a small disadvantaged business concern or submission of its application for certification. The list of authorized small disadvantaged business procurement mechanisms and regions is posted at <http://www.arnet.gov/References/sdbadjustments.htm>. The offeror shall use the list in effect on the date of this solicitation. ``Address,' as used in this provision, means the address of the offeror as listed on the Small Business Administrations register of small disadvantaged business concerns or the address on the completed application that the concern has submitted to the Small Business Administration or a Private Certifier in accordance with 13 CFR part 124, subpart B. For joint ventures, ``address'' refers to the address of the small disadvantaged business concern that is participating in the joint venture.

(c) Penalties and Remedies. Anyone who misrepresents any aspects of the disadvantaged status of a concern for the purposes of securing a contract or subcontract shall:

- (1) Be punished by imposition of a fine, imprisonment, or both;
- (2) Be subject to administrative remedies, including suspension and debarment; and
- (3) Be ineligible for participation in programs conducted under the authority of the Small Business Act.

52.222-21 Prohibition of Segregated Facilities. (Feb 1999)

(a) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

(End of clause)

52.222-22 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999)

The offeror represents that --

(a) () It has, () has not participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation;

(b) () It has, () has not, filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (DEC 2001)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 38 U.S.C. 4212(d) (i.e., if it has any contract containing Federal Acquisition Regulation clause 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans), it has submitted the most recent VETS-100 Report required by that clause.

(End of provision)

52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)

(a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

(b) By signing this offer, the offeror certifies that--

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release

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Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

() (i) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

() (ii) The facility does not have 10 or more full-time employees as specified in section 313.(b)(1)(A) of EPCRA 42 U.S.C. 11023(b)(1)(A);

() (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

() (iv) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

() (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

(End of clause)

52.236-28 PREPARATION OF PROPOSALS--CONSTRUCTION (OCT 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms, and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including--

(1) Lump sum price;

(2) Alternate prices;

(3) Units of construction; or

(4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items,

failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words "no proposal" in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission.

(End of provision)

252.247-7022 REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992)

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term supplies is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) Representation. The Offeror represents that it:

___ (1) Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

___ (2) Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

(End of provision)

General Decision Number: NV030009 01/23/2004

Superseded General Decision Number: NV020009

State: **Nevada**

Construction Types: Building

Counties: **Clark** and Nye Counties in **Nevada**.

DOES NOT INCLUDE **NEVADA** TEST SITE AND TONOPAH TEST RANGE

BUILDING **CONSTRUCTION** PROJECTS (does not include residential

construction consisting of single family homes and apartments

up to and including 4 stories)

Modification Number Publication Date

0 06/13/2003

1 10/31/2003

2 11/21/2003

3 12/05/2003

4 12/29/2003

5 01/23/2004

CARP1780-003 07/01/2003

Rates Fringes

Carpenters: (Cabinet making
and installing, Accoustical
installing, etc.,

Batt/blown insulating,

Drywall hanging, Metal

studs and welding, Siding

and overhead doors, Frame

work, Form work, Metal

building erecting, Metal

roof installing, Sawman,

Seating installing,

Scaffolding, Floor

Installing, Millwork,

Precast erectors, Modular

furniture installing,

Computer floor installing,

Furniture installing,

Plastic Water stop

installing and Drapery

installing)

30 Mile radius around Las Vegas (Measured from the intersection of Maryland Parkway and Charleston Blvd.):.....\$ 26.61	11.41
30 to 50 Mile radius from the intersection of Maryland Parkway and Charleston Blvd.....\$ 28.11	11.41
Laughlin Area.....\$ 28.61	11.41
Over 50 Mile radius from the intersection of Maryland Parkway and Charleston Blvd.....\$ 29.86	11.41

CARP1827-001 07/01/2003

Rates	Fringes
Millwright	
20 Mile radius around Las Vegas (Measured from the intersection of Maryland Parkway and Charleston Blvd.):.....\$ 24.68	14.34
20 to 40 Mile radius from the intersection of Maryland Parkway and Charleston Blvd.....\$ 26.18	14.34
Over 40 Mile radius from the intersection of Maryland Parkway and Charleston Blvd.....\$ 27.93	14.34

ELEC0357-005 09/29/2003

Rates	Fringes
Line Construction:	
Equipment Operator.....\$ 30.99	12.35+4%

Groundman.....	\$ 24.79	12.35+4%
Lineman.....	\$ 30.99	12.35+4%

 ELEV0018-003 09/29/2003

	Rates	Fringes
Elevator Mechanic.....	\$ 34.76	10.125+a

FOOTNOTE:

a. Employer contributes 8% of the basic hourly rate for over 5 years service and 6% of the basic hourly rate for 6 months to 5 years service as Vacation Pay Credit. Seven Paid Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Friday after Thanksgiving Day; and Christmas Day.

 * ENGI0012-008 07/01/2003

From the City Hall of Las Vegas 20 Miles to 40 Miles-add \$1.50 per hour to wage rates.

40 Miles to 60 Miles-add \$2.50 per hour to wage rates.

Over 60 Miles-add \$3.00 per hour to wage rates,

CLARK COUNTY

	Rates	Fringes
Power equipment operator - crane (Including Piledriving & Hoisting Equipment) Group 1 Engineer oiler; Fork lift operator (under 5 tons capacity).....	\$ 29.09	13.15
Group 2 Truck crane oiler.....	\$ 30.04	13.15
Group 3 A-frame or winch truck operator; Ross carrier operator (jobsite).....	\$ 30.33	13.15
Group 4		

Bridge-type unloader
and turntable
operator; Helicopter
hoist operator.....\$ 30.47 13.15

Group 5

Stinger crane
(Austin-Western or
similar type); Tugger
hoist operator (1
drum).....\$ 30.69 13.15

Group 6

Bridge crane
operator; Cretor
crane operator;
Forklift operator
(over 5 tons); Hoist
operator (Chicago
boom and similar
type); Lift mobile
operator; Lift slab
machine operator
(Vagtborg and similar
types); Material
hoist operator;
Shovel, backhoe,
dragline, clamshell
operator (over 3/4
yd. and up to 5 cu.
yds. mrc); Tugger
hoist operator.....\$ 30.80 13.15

Group 7

Pedestal crane
operator; Shovel,
backhoe, dragline,
clamshell operator
(over 5 cu. yds.
mrc); Tower crane

repair; Tugger hoist
operator (3 drum).....\$ 30.92 13.15

Group 8

Crane operator (up to
and including 25 ton
capacity); Crawler
transporter operator;
Derrick barge
operator (up to and
including 25 ton
capacity); Hoist
operator, stiff legs,
Gyderrick or similar
type (up to and
including 25 ton
capacity); Shovel,
backhoe, dragline,
clamshell operator
(over 7 cu. yds. mrc).....\$ 31.09 13.15

Group 9

Crane operator (over
25 tons and up to and
including 50 tons
mrc); Derrick barge
operator (over 25
tons up to and
including 50 tons
mrc); Highline
cableway operator;
Hoist operator, stiff
legs, Guy derrick or
similar type (over 25
tons up to and
including 50 tons
mrc); K-crane
operator; Polar
crane operator; Tower

crane operator.....\$ 31.26 13.15

Group 10

Crane operator (over
50 tons and up to and
including 100 tons
mrc); Derrick barge
operator (over 50
tons up to and
including 100 tons
mrc); Hoist operator,
stiff legs, Guy
derrick or similar
type (over 50 tons up
to and including 100
tons mrc).....\$ 32.26 13.15

Group 11

Crane operator (over
100 tons and up to
and including 200
tons mrc); Derrick
barge operator (over
100 tons up to and
including 200 tons
mrc); Hoist operator,
stiff legs, Guy
derrick or similar
type (over 100 tons
up to and including
200 tons mrc); Mobile
tower crane operator
(over 100 tons up to
and including 200
tons mrc).....\$ 33.26 13.15

Group 12

Crane operator (over
200 tons up to and
including 300 tons

mrc); Derrick barge operator (over 200 tons up to and including 300 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 200 tons, up to and including 300 tons mrc); Mobile tower crane operator (over 200 tons, up to and including 300 tons mrc).....\$ 34.26 13.15

Group 13

Crane operator (over 300 tons); Derrick barge operator (over 300 tons); Helicopter pilot; Hoist operator, stiff legs, Guy derrick or similar type (over 300 tons); Mobile tower crane operator (over 300 tons).....\$ 35.26 13.15

Power Equipment Operators -

Tunnel and Underground Work:

Group 1

Skiploader (wheel type up to 3/4 yd. without attachment).....\$ 29.59 13.15

Group 2

Power-driven jumbo form setter operator.....\$ 30.54 13.15

Group 3

Dinkey locomotive or

motorman (up to and including 10 tons).....\$ 30.83 13.15

Group 4

Bit sharpener;
Equipment greaser (grease truck);
Slipform pump operator (power-driven hydraulic lifting device for concrete forms); Tugger hoist operator (1 drum);
Tunnel locomotive operator (over 10 and up to and including 30 tons); Welder - general.....\$ 30.97 13.15

Group 5

Backhoe operator (up to and including 3/4 yd.); Small Ford, Case or similar;
Drill doctor;
Grouting machine operator; Heading shield operator;
Heavy-duty repairperson;
Loader operator (Athey, Euclid, Sierra and similar types); Mucking machine operator (1/4 yd., rubber-tired, rail or track type);
Pneumatic concrete

placing machine
 operator
 (Hackley-Presswell or
 similar type);
 Pneumatic heading
 shield (tunnel);
 Pumpcrete gun
 operator; Tractor
 compressor drill
 combination
 operator; Tugger
 hoist operator (2
 drum); Tunnel
 locomotive
 operator (over 30
 tons).....\$ 31.19 13.15

Group 6

Heavy duty repairman
 - welder combination.....\$ 31.30 13.15

Group 7

Tunnel mole boring
 machine operator.....\$ 31.42 13.15

Power equipment operators:

Group 1

Bargeman, brakeman,
 compressor operator
 (when more than five
 (5) 900 CFM or larger
 units, additional
 operator required),
 ditch witch, with
 seat or similar type
 equipment, elevator
 operator - inside,
 engineer oiler,
 Forklift
 Operator(under 5 tons

capacity), generator
operator, generator,
pump or compressor
plant operator, pump
operator, signalman,
switchman.....\$ 27.74 13.15

Group 2

Asphalt - rubber
plant operator, Nurse
Tank Operator
concrete mixer
operator - skip type,
conveyor operator,
fireman,Forklift
Operator(over 5
tons), hydrostatic
pump operator, oiler
crusher (asphalt or
concrete plant),
Rotery drill
Helper(oilfield),
skiploader (when
wheel type up to 3/4
yd. without
attachment), soils
field technician, tar
pot fireman,
temporary heating
plant operator,
trenching machine
oiler.....\$ 28.69 13.15

Group 3

Asphalt - rubber
blend operator,
equipment greaser
(rack), ford ferguson
(with dragtype

attachments),
 helicopter radioman
 (ground), power
 concrete curing
 machine operator,
 power concrete saw
 operator, power -
 driven jumbo form
 setter operator,
 stationary pipe
 wrapping and cleaning
 machine operator.....\$ 28.98 13.15

Group 4

Asphalt plant
 fireman, backhoe
 operator (mini-max or
 similar type), boring
 machine operator,
 boxman or mixerman
 (asphalt or
 concrete), Building
 and/or Structure
 Inspector, chip
 spreading machine
 operator, Concrete
 Cleaning
 Decontamination
 machine Operator,
 concrete pump
 operator (small
 portable), drilling
 machine operator,
 small auger types
 (Texoma super
 economatic or similar
 types - Hughes 100 or
 200 or similar types

- drilling depth of
 30' maximum),
 equipment greaser
 (grease truck), guard
 rail post driver
 operator, highline
 cableway signalman,
 hydra-hammer-aero
 stomper, Power
 Concrete Curing
 Machine
 Operator,Power
 Concrete Saw
 Operator,
 Power-Driven Jumbo
 Form Setter
 Operator,power
 sweeper operator,
 roller operator
 (compacting), screed
 operator (asphalt or
 concrete), trenching
 machine operator (up
 to 6 ft.).....\$ 30.47 13.15

Group 5

Equipment Greaser
 (Grease Truck).....\$ 31.57 13.15

Group 6

Asphalt plant
 engineer, batch plant
 operator, bit
 sharpener, concrete
 joint machine
 operator (canal and
 similar type),
 concrete planer
 operator, deck engine

operator, derrickman
(oilfield type),
drilling machine
operator, bucket or
auger types (Caldwell
100 bucket or similar
types - Watson 1000
auger or similar
types - Texoma 330,
500 or 600 auger or
similar types -
drilling depth of 45'
maximum), drilling
machine operator
(including water
wells), hydrographic
seeder machine
operator (straw, pump
or seed), Jackson
track maintainer, or
similar type,
Kalamazoo switch
tamper, or similar
type, machine tool
operator, Maginnis
internal full slab
vibrator, mechanical
berm, curb or gutter
(concrete or
asphalt), mechanical
finisher operator
(concrete,
Clary-Johnson-Bidwell
or similar type),
pavement breaker
operator (truck
mounted), road oil

mixing machine
operator, roller
operator (asphalt or
finish), rubber -
tired earth moving
equipment (single
engine, up to and
including 25 yds.
struck),
self-propelled tar
pipelining machine
operator, skiploader
operator (crawler and
wheel type, over 3/4
yd. and up to and
including 1-1/2
yds.), slip form pump
operator (power
driven hydraulic
lifting device for
concrete forms),
tractor operator -
bulldozer,
tamper-scraper
(single engine, up to
100 h.p. flywheel and
similar types, up to
and including D-5 and
similar types),
tugger hoist
operator(1
drum),Ultra High
Pressure Waterjet
Cutting Tool System
Operator,VacuumBlasting
Machine
Operator,Welder-Genera

I.....\$ 30.69 13.15

Group 7

Welder-General

(Multi-Shift).....\$ 31.79 13.15

Group 8

Asphalt or concrete spreading operator (tamping or finishing), asphalt paving machine operator (Barber Greene or similar type - 1 screedman required), Asphalt -rubber distributor operator, backhoe operator (up to and including 3/4 yd.), small Ford, Case or similar, cast-in-place pipe laying machine operator, combination mixer and compressor operator (gunite work), compactor operator (self-propelled), concrete mixer operator (paving), crushing plant operator, drill doctor, drilling machine operator, bucket or auger types (Caldwell 150 bucket or similar types -

Watson 1500, 2000
2500 auger or similar
types - Texoma 700,
800 auger or similar
types - drilling
depth of 60'
maximum), elevating
grader operator,
grade checker,
gradall operator,
grouting machine
operator, heavy-duty
repairman, Heavy
Equipment Robotics
Operator, kalamazoo
ballast regulator or
similar type, Kolman
belt loader and
similar type, Le
Tourneau blob
compactor or similar
type, loader operator
(Athey, Euclid,
Sierra and similar
types), Master
Environmental
Maintenance Mechanic,
Pneumatic Concrete
Placing Machine
Operator
(Hackley-Presswell or
similar type),
pumpcrete Gun
operator, rotary
drill operator
(excluding caisson
type), rubber-tired

earth-moving
equipment operator
(single engine,
Caterpillar, Euclid,
Athey Wagon and
similar types with
any and all
attachments over 25
yds. up to and
including 50 cu. yds.
struck), rubber-tired
earth-moving
equipment operator
(multiple engine up
to and including 25
yds. struck),
rubber-tired scraper
operator
(self-loading paddle
wheel type - John
Deere, 1040 and
similar single
unit), self-propelled
curb and gutter
machine operator,
skipload operator
(crawler and wheel
type over 1-1/2 yds.
up to and including
6-1/2 yds.), Soil
Remediation Plant
operator (C.M.I.
Enviro Tech Thermal
or Similar types)
(Oiler Required group
2) surface heaters
and planer operator,

tractor compressor
 drill combination
 operator, tractor
 operator (any type
 larger than D-5 - 100
 flywheel h.p. and
 over, or similar -
 bulldozer, tamper,
 scraper and push
 tractor single
 engine), tractor
 operator (boom
 attachments),
 traveling pipe
 wrapping, cleaning
 and bending machine
 operator, trenching
 machine operator
 (over 6 ft. depth
 capacity, oiler
 required) Ultra High
 Pressure Waterjet
 Cutting Tool System
 Mechanic.....\$ 30.80 13.15

Group 9

Heavy duty repairman.....\$ 31.90 13.15

Group 10

Drilling machine
 operator, bucket or
 auger types (Caldwell
 200 B bucket or
 similar types -
 Watson 3000 or 5000
 auger or similar
 types - Texoma 900
 auger or similar
 types - drilling

depth of 105'
 maximum), dual drum
 mixer, **Heavy** Duty
 Repairman Welder
 Combination, monorail
 locomotive operator
 (diesel, gas or
 electric), motor
 patrol - blade
 operator (single
 engine), multiple
 engine tractor
 operator (Euclid and
 similar type - except
 Quad 9 cat.),
 rubber-tired
 earth-moving
 equipment operator
 (single engine, over
 50 yds. struck),
 rubber-tired
 earth-moving
 equipment operator
 (multiple engine,
 Euclid, Caterpillar
 and similar over 25
 yds. and up to 50
 yds.), tower crane
 repair person,
 tractor loader
 operator (crawler
 and wheel type over
 6-1/2 yds.),
 Welder-Certified,
 Woods mixer operator
 (and similar pugmill
 equipment).....\$ 30.92 13.15

Group 11

Dynamic compactor

LDC350 (or similar

types- two (2)

operators required),

Heavy Duty

Repairman-Welder

Combination

(Multi-shift),

Welder-Certified(Muti-

Shift).....\$ 32.02 13.15

Group 12

Auto grader operator,

automatic slip form

operator, drilling

machine operator,

bucket or auger types

(Caldwell, auger 20

CA or similar types -

Watson auger 6000 or

similar types -

drilling depth of

175' maximum), hoe

ram or similar with

compressor, mass

excavator operator,

mechanical finishing

machine operator,

mobile form traveler

operator, motor

patrol operator

(multi-engine), pipe

mobile machine

operator,

rubber-tired

earth-moving

equipment operator

(multiple engine,
 Euclid, Caterpillar
 and similar type,
 over 50 cu. yds.
 struck), rubber-tired
 self-loading scraper
 operator
 (paddle-wheel-auger
 type self-loading -
 two (2) or more
 units), Vermeer Rock
 trencher (or similar
 types).....\$ 31.09 13.15

Group 13

Rubber-tired
 earth-moving
 equipment operator
 operating equipment
 with push-pull system
 (single engine, up to
 and including 25 yds.
 struck).....\$ 31.19 13.15

Group 14

Canal liner operator,
 canal trimmer
 operator,
 remote-control
 earth-moving
 equipment operator,
 wheel excavator
 operator.....\$ 31.22 13.15

Group 15

Rubber-tired
 earth-moving
 equipment operator,
 operating equipment
 with push-pull system

(single engine,
 Caterpillar, Euclid,
 Athey Wagon and
 similar types with
 any and all
 attachments over 25
 yds. and up to and
 including 50 yds.
 struck), rubber-tired
 earth-moving
 equipment operator,
 operating equipment
 with push-pull system
 (multiple engine - up
 to and including 25
 yds. struck).....\$ 31.30 13.15

Group 16

Rubber-tired
 earth-moving
 equipment operator,
 operating equipment
 with push-pull system
 (single engine, over
 50 yds. struck),
 rubber-tired
 earth-moving
 equipment operator,
 operating equipment
 with push-pull system
 (multiple engine,
 Euclid, Caterpillar
 and similar, over 25
 yds. and up to 50
 yds. struck).....\$ 31.42 13.15

Group 17

Rubber-tired
 earth-moving

equipment operator,
 operating equipment
 with push-pull system
 (multiple engine,
 Euclid, Caterpillar
 and similar, over 50
 cu. yds. struck),
 tandem tractor
 operator (operating
 crawler type tractors
 in tandem - Quad 9
 and similar type).....\$ 31.59 13.15

Group 18

Rubber-tired
 earth-moving
 equipment operator,
 operating in tandem
 (scrapers, belly
 dumps and similar
 types in any
 combination,
 excluding compaction
 units - single
 engine, up to and
 including 25 yds.
 struck).....\$ 31.69 13.15

Group 19

Rotex concrete belt
 operator (or similar
 types), rubber-tired
 earth-moving
 equipment operator,
 operating in tandem
 (scrapers, belly
 dumps and similar
 types in any
 combination,

including compaction units - single engine, Caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. and up to and including 50 cu. yds. struck), rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - multiple engine, up to and including 25 yds. struck),.....\$ 31.80 13.15

Group 20

Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - single engine, over 50 yds. struck), rubber-tired earth moving equipment operator,

operating in tandem
 (scrapers, belly
 dumps and similar
 types in any
 combination,
 excluding compaction
 units - multiple
 engine, euclid,
 caterpillar and
 similar over 25 yds.
 and up to 50 yds.
 struck).....\$ 31.92 13.15

Group 21

Rubber-tired
 earth-moving
 equipment operator,
 operating in tandem
 (scrapers, belly
 dumps and similar
 types in any
 combination,
 excluding compaction
 units - multiple
 engine, Euclid,
 Caterpillar and
 similar type, over 50
 cu. yds. struck).....\$ 32.09 13.15

Group 22

Rubber-tired
 earth-moving
 equipment operator,
 operating equipment
 with the tandem
 push-pull system
 (single engine, up
 to and including 25
 yds. struck).....\$ 32.19 13.15

Group 23

Rubber-tired
earth-moving
equipment operator,
operating equipment
with the tandem
push-pull system
(single engine,
Caterpillar, Euclid,
Athey Wagon and
similar types with
any and all
attachments over 25
yds. and up to and
including 50 yds.
struck), rubber-tired
earth-moving
equipment operator,
operating with the
tandem push-pull
system (multiple
engine, up to and
including 25 yds.
struck).....\$ 32.30 13.15

Group 24

Rubber-tired
earth-moving
equipment operator,
operating equipment
with the tandem
push-pull system
(single engine, over
50 yds. struck),
rubber-tired
earth-moving
equipment operator,
operating equipment

with the tandem
 push-pull system
 (multiple engine,
 Euclid, Caterpillar
 and similar, over 25
 yds. and up to 50
 yds. struck).....\$ 32.42 13.15

Group 25

Concrete pump
 operator - truck
 mounted (oiler

0 required when boom
 1 over 105' or 36
 2 meters; Rubber-tired
 3 earth-moving
 4 equipment operator,
 5 operating equipment
 6 with the tandem
 7 push-pull system
 8 (multiple engine,
 9 Euclid, Caterpillar
 0 and similar type,
 1 over 50 cu. yds.
 2 struck).....\$ 32.59 13.15

3
 4 -----

5 IRON0001-011 07/01/2001

6
 7 Rates Fringes

8
 9 Ironworkers:
 0 Structural and Rebar.....\$ 26.08 14.575

1
 2 -----

3 LABO0872-001 07/01/1998

4
 5 Rates Fringes

6			
7	Plasterer tender		
8	0 to 20 miles from City		
9	Hall in Las Vegas.....\$ 22.79	5.49	
0	21 to 40 miles from		
1	City Hall in Las Vegas.....\$ 24.29	5.49	
2	41 to 60 miles from		
3	City Hall in Las Vegas.....\$ 25.29	5.49	
4	Laughlin Area.....\$ 25.04	5.49	
5	Over 60 miles from City		
6	Hall in Las Vegas.....\$ 25.79	5.49	

7
8 -----

9 LABO0872-004 07/01/2002

0			
1		Rates	Fringes
2			
3	Laborers:		
4	GROUP 1.....\$ 19.76	12.95	
5	GROUP 2.....\$ 19.97	12.95	
6	GROUP 3.....\$ 20.07	12.95	
7	GROUP 4.....\$ 17.26	12.95	

8
9 CLASSIFICATIONS

- 0
- 1 GROUP 1: Laborers, general; Landscape; Guinea-Chaser.
- 2
- 3 GROUP 2: Asphalt raker/ironer; Cement grinding; Concrete
- 4 worker (excluding concrete finishing); Vibrator.
- 5
- 6 GROUP 3: Jackhammer; Asbestos removal.
- 7
- 8 GROUP 4: Flaggers.

9 -----
0 MARB0003-003 03/02/1998

1			
2		Rates	Fringes

3
4 Marble Finisher.....\$ 15.11 3.25

5
6 Marble Setter.....\$ 22.62 3.67

7
8 -----

9 PAIN0159-002 07/01/2001

0
1 Rates Fringes

2
3 Painters:
4 Brush; Roller, Spray,
5 Paper hanger.....\$ 25.62 7.34

6
7 -----

8 PAIN0159-005 01/01/2002

9
0 Rates Fringes

1
2 Painter
3 Soft Floor Layer.....\$ 23.18 5.29

4
5 -----

6 PAIN2001-001 07/01/2002

7
8 Rates Fringes

9
0 Glazier.....\$ 29.31 9.65

1
2 -----

3 PLAS0797-001 07/01/2002

4
5 Rates Fringes

6
7 Cement Mason (Including
8 Hand and Machine concrete
9 finishing, floating,

0 troweling, magnesite,
 1 concrete scuplturing,
 2 cement finishing)
 3 0 to 30 Miles from City
 4 Hall in Las Vegas.....\$ 26.83 7.35
 5
 6 Cement Mason
 7 30 to 50 Miles from
 8 City Hall in Las Vegas.....\$ 28.33 7.35
 9 50 to 70 Miles from
 0 City Hall in Las Vegas.....\$ 29.33 7.35
 1 Over 70 Miles from City
 2 Hall in Las Vegas.....\$ 30.33 7.35
 3

4 -----

5 PLAS0797-003 07/01/2002

6

7 Rates Fringes

8

9 Plasterer

0 0 to 20 Miles from the
 1 City Hall of Las Vegas.....\$ 25.34 7.22
 2 20 to 40 Miles from the
 3 City Hall of Las Vegas.....\$ 26.84 7.22
 4 40 to 60 Miles from the
 5 City Hall of Las Vegas.....\$ 27.84 7.22
 6 Over 60 Miles from the
 7 City Hall of Las Vegas.....\$ 27.84 7.22
 8

9 (8 hour maximum per day, plus .15 cents per mile for one
 0 round trip)

1 -----

2 PLUM0350-006 08/01/2003

3

4 NYE COUNTY (NORTH OF HIGHWAY NO. 6)

5

6 Rates Fringes

7

8 Plumber/Pipefitter

9 (Includes HVAC Piping,

0 Pipe Welding,

1 Refrigeration and

2 Steamfitters).....\$ 25.10 11.80

3

4 -----

5 * PLUM0525-001 06/01/2003

6

7 **CLARK AND NYE (SOUTH OF HIGHWAY NO. 6) COUNTIES**

8

9 Rates Fringes

0

1 Plumber/Pipefitter

2 (Includes HVAC Piping,

3 Pipe Welding,

4 Refrigeration and

5 Steamfitters).....\$ 31.51 12.11

6

7 -----

8 ROOF0162-003 06/01/2002

9

0 Rates Fringes

1

2 Roofer, Single Ply.....\$ 19.52 4.68

3

4 -----

5 SFNV0669-004

6

7 Rates Fringes

8

9 Sprinkler Fitter.....\$ 28.70 6.40

0

1 -----

2 SHEE0026-001 10/01/2002

3

4 NYE COUNTY (NORTH OF THE 1ST STANDARD PARALLEL LINE NORTH OF
5 THE 38TH PARALLEL)

6

7 Rates Fringes

8

9 Sheet metal worker

0 (Includes HVAC

1 ductwork, Space Frame

2 Installion,

3 Installation Odor

4 control duct/Fireplace

5 Gutter/downspout

6 Installation,

7 Installation Demo

8 equipment, Metal

9 siding, Metal cabinet

0 installation, Brass

1 railing installation,

2 Kitchen equipment

3 installation, Set Reg &

4 Equip., Equipment

5 installing, Flashing

6 and Skylight installing)....\$ 25.93 9.92

7

8 -----

9 SHEE0088-003 07/01/2003

0

1 **CLARK** AND NYE (SOUTH OF THE 1ST STANDARD PARALLEL LINE NORTH OF
2 THE 38TH PARALLEL) COUNTIES

3

4 Rates Fringes

5

6 Sheet metal worker

7 (Includes HVAC

8 ductwork, Space Frame

9 Installation,

0 Installation odor

1 control duct/Fireplace,
 2 Gutter downspout
 3 installation, Shelving
 4 Stainless installation,
 5 Installation Demo
 6 equipment, Metal
 7 siding, Metal cabinet
 8 installation, Brass
 9 railing installation,
 0 Kitchen equipment
 1 installation, Set Reg &
 2 Equip., Equipment
 3 installing, Flashing
 4 and Skylight installing)....\$ 33.45 11.12
 5
 6 -----

7 SUNV1995-004 10/12/1995

8

9 Rates Fringes

0

1 Bricklayer

2 (includes cement block).....\$ 18.79

3

4 Fence Erector

5 (wood & chain link).....\$ 13.42

6

7 Ironworker

8 (ornamental).....\$ 23.75 8.36

9

0 Laborers:

1 Mason Tender.....\$ 15.86

2 Pipelayer.....\$ 14.23

3 Water Blaster Operator.....\$ 17.47 4.32

4

5 Painter

6 (parking lot striping).....\$ 7.00

7

8 Power equipment operators:
 9 Grader.....\$ 19.79
 0
 1 Roofer
 2 Built Up Roofing.....\$ 15.29 1.98
 3
 4 Tile Finisher.....\$ 12.67
 5
 6 Tile Setter.....\$ 18.02 2.63
 7

8 -----

9 TEAM0631-003 07/01/2003

0

1 Rates Fringes

2

3 Truck drivers:

4 GROUP 1:.....\$ 22.56 11.11
 5 GROUP 2:.....\$ 22.67 11.11
 6 GROUP 3:.....\$ 22.88 11.11
 7 GROUP 4:.....\$ 23.06 11.11
 8 GROUP 5:.....\$ 23.21 11.11
 9 GROUP 6:.....\$ 23.56 11.11

0

1 30-50 Miles from City Hall, Las Vegas \$1.00 above the base
 2 rate.

3 50-70 Miles from City Hall, Las Vegas \$2.00 above the base
 4 rate.

5 70-80 Miles from City Hall, Las Vegas \$3.00 above the base
 6 rate.

7 Over 80 Miles from City Hall, Las Vegas \$3.50 above the base
 8 rate.

9 Laughlin and Mesquite Areas, \$3.00 above the base rate.

0

1 Group 1: Dump trucks (less than 12 yards water level);
 2 trucks (legal payload capacity less than 15 tons); water and
 3 fuel trucks (under 2500 gallons); pickups; service station
 4 attendant; drivers of busses (on jobsite used for

5 transportation of up to 16 passengers); teamster equipment
6 (highest rate for dual craft operation); warehousemen.

7

8 Group 2: Dump trucks (12 yards but less than 16 yards water
9 level); trucks (legal payload capacity between 15 and 20
0 tons); transit mix trucks (under 3 yds.); dumpcrete trucks
1 (less than 6-1/2 yds. water level); gas and oil pipeline
2 working truck drivers, including winch truck and all sizes of
3 trucks; water and fuel truck drivers (2,500 gallon to 4,000
4 gallon); truck greaser; drivers of busses (on jobsite used
5 for transportation of sixteen (16) or more passengers);
6 warehouse clerk.

7

8 Group 3: Dump trucks (16 yds. up to and including 22 yds.
9 water level); driver of trucks (legal payload cap. 20 tons
0 but less than 25 tons); dumpster trucks; drivers of
1 transit-mix trucks (3 yds. but less than 6 yds.); dumpcrete
2 trucks (6-1/2 yds. water level and over); fork lift driver;
3 ross carrier driver; highway water and fuel drivers (4,001
4 gallons but less than 6,000 gallons); stock room clerk;
5 tireman.

6

7 Group 4: Transit-mix trucks (6 yds. or more); dump trucks
8 (over 22 yds. water level); trucks (legal payload capacity 25
9 tons and over); fuel and water trucks (6,000 gallons and
0 over).

1

2 Group 5: Drivers of trucks and trailers in combination (six
3 axles or more).

4

5 Group 6: All offroad equipment; truck repairmen and drivers
6 of road oil spreader trucks DW 10 and DW 20 euclid-type
7 equipment, letourneau pulls, terra cobras and similar types
8 of equipment; also PB and similar type trucks when performing
9 work within Teamsters' jurisdiction, regardless of types of
0 attachment including power units pulling off- highway belly
1 dumps in tandem.

2 -----

3

4 WELDERS - Receive rate prescribed for craft performing
5 operation to which welding is incidental.

6 =====

7

8 Unlisted classifications needed for work not included within
9 the scope of the classifications listed may be added after
0 award only as provided in the labor standards contract clauses
1 (29CFR 5.5 (a) (1) (ii)).

2

3 -----

4

5 In the listing above, the "SU" designation means that rates
6 listed under the identifier do not reflect collectively
7 bargained wage and fringe benefit rates. Other designations
8 indicate unions whose rates have been determined to be
9 prevailing.

0

1 -----

2

3 WAGE DETERMINATION APPEALS PROCESS

4

5 1.) Has there been an initial decision in the matter? This can
6 be:

7

- 8 * an existing published wage determination
- 9 * a survey underlying a wage determination
- 0 * a Wage and Hour Division letter setting forth a position on
- 1 a wage determination matter
- 2 * a conformance (additional classification and rate) ruling

3

4 On survey related matters, initial contact, including requests
5 for summaries of surveys, should be with the Wage and Hour
6 Regional Office for the area in which the survey was conducted
7 because those Regional Offices have responsibility for the
8 Davis-Bacon survey program. If the response from this initial

9 contact is not satisfactory, then the process described in 2.)
0 and 3.) should be followed.

1

2 With regard to any other matter not yet ripe for the formal
3 process described here, initial contact should be with the
4 Branch of **Construction** Wage Determinations. Write to:

5

6 Branch of **Construction** Wage Determinations

7

8 Wage and Hour Division

9

0 U.S. Department of Labor

1

2 200 Constitution Avenue, N.W.

3

4 Washington, DC 20210

5

6 2.) If the answer to the question in 1.) is yes, then an
7 interested party (those affected by the action) can request
8 review and reconsideration from the Wage and Hour Administrator
9 (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

0

1 Wage and Hour Administrator

2

3 U.S. Department of Labor

4

5 200 Constitution Avenue, N.W.

6

7 Washington, DC 20210

8

9 The request should be accompanied by a full statement of the
0 interested party's position and by any information (wage
1 payment data, project description, area practice material,
2 etc.) that the requestor considers relevant to the issue.

3

4 3.) If the decision of the Administrator is not favorable, an
5 interested party may appeal directly to the Administrative

6 Review Board (formerly the Wage Appeals Board). Write to:

7

8 Administrative Review Board

9

0 U.S. Department of Labor

1

2 200 Constitution Avenue, N.W.

3

4 Washington, DC 20210

5

6 4.) All decisions by the Administrative Review Board are final.

7

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0 END OF GENERAL DECISION

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Hydrant Fuel System, Nellis AFB, Nevada

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION / REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01355A	SD-01 Preconstruction Submittals														
			Environmental Protection Plan	1.7	G AE												
			SD-03 Product Data														
			Hazardous Material Listing	3.5.3.2	G AE												
			SD-11 Closeout Submittals														
			Soil Stockpile and Sample Results	3.14.4	G AE												
			As-Built														
		02763A	SD-03 Product Data														
			Equipment	1.4	G AE												
			Composition Requirements		G AE												
			Qualifications														
			SD-06 Test Reports														
			Sampling and Testing		G AE												
			SD-07 Certificates														
			Volatile Organic Compound (VOC)		G AE												
		15899	SD-01 Preconstruction Submittals														
			System Start-up Plan		G AE												
			SD-06 Test Reports														
			Test Reports		G AE												
			Final Reports														
			SD-11 Closeout Submittals														
			Certification of Entire System		G AE												
		16375A	SD-02 Shop Drawings														
			Electrical Distribution System	3.10.3	G AE												
			As-Built Drawings		G AE												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Hydrant Fuel System, Nellis AFB, Nevada

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION REVIEW	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		16375A	SD-03 Product Data														
			Nameplates	2.2	G AE												
			Material and Equipment	2.1													
			General Installation Requirements	3.1	G AE												
			SD-06 Test Reports														
			Factory Tests		G AE												
			Field Testing		G AE												
			Operating Tests	3.10.8	G AE												
			Cable Installation	3.2.1.4	G AE												
			SD-07 Certificates														
			Material and Equipment	2.1	G AE												
			Cable Joints	3.3	G AE												
			Cable Installer Qualifications		G AE												
			SD-10 Operation and Maintenance Data														
			Electrical Distribution System	3.10.3	G AE												

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SECTION 01355A

ENVIRONMENTAL PROTECTION
02/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171 - 178	Hazardous Materials Regulations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps on Engineers Safety and Health Requirements Manual
WETLAND MANUAL	Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

NELLIS AFB

FRP	Nellis AFB Plan 19-1, Facility Response Plan
SWPPP	Final Stormwater Pollution Prevention Plan for Nellis AFB, January 2001.
NVR050000	State of Nevada, Stormwater General Permit for Industrial Activities

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.5 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.6 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.7 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include

swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with the WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G-AE

The environmental protection plan.

SD-03 Product Data

Hazardous Material Listing; G-AE

List of all hazardous materials brought onto the base

SD-11 Closeout Submittals

Soil Stockpile and Sample Results As-Built; G-AE

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of

known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- e. Copies of documents prepared by Contractor to comply with the base's National Pollution Discharge Elimination System (NPDES) Industrial Stormwater Permit. Obtain a Storm Water Construction Permit from the Nevada Division of Environmental Protection's Bureau of Water Pollution Control. Prepare and submit a Notice of Intent, Stormwater Pollution Prevention Plan (SWPPP) and Notice of Termination for the work.
- f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.
- g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud

transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. Drawing showing the location of borrow areas, if any.

j. The Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer and Base Fire Department, Base Response Personnel, Base Environmental Office in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste

generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. A copy of the Dust Control Permit from the Clark County District Board of Health.

n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, disinfection water, hydrostatic test water, and water used in flushing of lines.

p. A historical, archaeological, cultural resources biological resources and wetlands plan that identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

1.7.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the Contractor

and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

The Contractor shall be responsible for obtaining and complying with all environmental permits and commitments required by Federal, State, Regional, and local environmental laws and regulations.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the

areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as specified in Section 01356A STORM WATER POLLUTION PREVENTION MEASURES. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. The Contractor's best management practices shall also be in accordance with the Base's National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Prevention Plan (SWPPP) which may be reviewed at the Environmental Office. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of Nevada rules.

3.4.4 Burning

Burning shall be prohibited on the Government premises.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.

3.5.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water.

Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

3.5.3.1 General

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262 and shall manage and store hazardous waste in accordance with the Base hazardous waste management plan. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off Government property within 90 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer and the Base Environmental Office. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The Contractor shall coordinate the disposition of hazardous waste with the Base Hazardous Waste Manager and the Contracting Officer.

3.5.3.2 Hazardous Material Listing

Contractor shall prepare and provide a list of all hazardous materials brought onto the base within one week of material arriving at the facility.

Material listing shall be provided to "HAZMART" located in Building 811.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations.

3.5.5 Waste Water

Disposal of waste water shall be as specified below.

- a. Waste water from construction activities, such as onsite material

processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations.

- b. Water generated from the flushing of lines after disinfection or hydrostatic testing shall be discharged to the storm drain. Discharge of this water shall be in accordance with the provisions of the existing Base NPDES Permit and the Stormwater Pollution Prevention Plan. The depth to groundwater at the site is estimated to be greater than 60 feet below grade. Dewatering is not anticipated.

3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.7 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. The Contractor shall submit a report to the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. The following shall be included in the report:

- a. Construction and Demolition (C&D) Debris Disposed = _____ in cubic yards or tons, as appropriate.
- b. Construction and Demolition (C&D) Debris Recycled = _____ in cubic yards or tons, as appropriate.
- c. Total C&D Debris Generated = _____ in cubic yards or tons, as appropriate.
- d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) = _____ in cubic yards or tons, as appropriate.

3.8 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result

in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.9 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.10 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.11 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.12 MILITARY MUNITIONS

In the event the Contractor discovers or uncovers military munitions as defined in 40 CFR 260, the Contractor shall immediately stop work in that area and immediately inform the Contracting Officer.

3.13 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. Contractor personnel working at the excavation site shall be trained to work with hazardous materials in accordance with 29 CFR 1910.120 and other state and local requirements. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.14 CONTAMINATED MEDIA MANAGEMENT

Contaminated environmental media consisting of, but not limited to, storm water, ground water, soils, and sediments shall be managed by the Contractor.

3.14.1 Soil and Sediments

- a. The Contractor will be responsible for screening excavated materials with a photoionization detector. Media that is otherwise acceptable for backfill purposes and has PID readings less than 90 parts per million (ppm) shall be stockpiled for reuse at the construction site. Media with PID readings greater than 90 ppm shall be transported by the Contractor to the stockpile area located adjacent to the designated laydown yard. Screening results shall be recorded in a logbook and made available to Base personnel upon request.
- b. Potentially contaminated materials shall be placed on an impermeable membrane that is a minimum 12 mils thick and covered with a membrane that is a minimum of 6 mils thick. Contractor shall provide adequate means of holding membrane covers in place and perform periodic inspections to verify the integrity of the cover throughout the construction activities. Stockpiles shall be limited to 100-cubic-yards for sampling purposes.
- c. Potentially contaminated soil shall be stored until Base Environmental personnel can collect samples and receive analytical results from the laboratory. Contact Mr. DJ Haarklau at 702-652-6115 to coordinate sampling. A single four point composite sample shall be collected from each 100-cubic-yard stockpile and analyzed for total petroleum hydrocarbons (TPH) by EPA method 8015 Modified (8015M) and volatile organic hydrocarbons (VOCs) by method 8260.

Soil exhibiting total TPH levels below 100 mg/kg shall be transported by the Contractor back to the excavation site for reuse. Soil exhibiting total TPH levels in excess of 100 mg/kg shall be loaded by the Contractor for disposal. Hauling and disposal of contaminated soil shall be managed and paid for by the Base.

3.14.2 Water

- a. The Contractor shall berm open excavations to divert away surface water, provide stormwater pollution prevention measures indicated in Section 01356A and comply with the provisions of the Stormwater General Permit for Industrial Activities attached to this Section. All surface water entering the excavation will be considered contaminated unless sample results indicate otherwise.
- b. Contractor shall pump water encountered in the excavation to temporary storage receptacles. The Contractor shall supply, maintain and clean water storage receptacles at the site. Potentially contaminated water shall be stored until Base Environmental personnel can collect samples and receive analytical results from the laboratory. Contact Mr. John Roe at 702-652-2072 to coordinate water sampling. One sample shall be collected once the tank is full, or upon completion of the work whichever comes first, and analyzed for TPH by Method 8015M, VOC's by Method 8260 and metals by Method 6010. Collection of samples and analytical services shall be performed or paid for by the Base.
- c. Water exhibiting contaminant concentrations below those listed in the Base NPDES Permit can be discharged to the storm drain. Water

exhibiting concentrations in excess of NPDES Permit levels shall be transported offsite for disposal. Discharge of water to the storm sewer shall be conducted only under the supervision of Base Environmental personnel. Contact Mr. John Roe to schedule discharge events. Contaminated water disposal shall be managed and paid for by the Base.

3.14.3 Drill Cuttings

(AMENDMENT 4) Drill mud and cuttings generated during installation of the deep anode bed shall be stored in Contractor provided water tight roll-off bins at the drilling site. Ample time shall then be provided such that the material dries in the sun to a near solid state. Contractor shall then contact Mr. DJ Haarklau at 702-652-6115 who will collect composite samples for analytical testing. Following sampling, Contractor shall haul solids to Las Vegas Paving (approximately 7 mile haul distance) for ultimate disposal. Contractor shall coordinate delivery of solids with Mr. Haarklau and Mr. Dave Breault of Las Vegas Paving at 702-649-7423. Disposal costs shall be paid by the Base. (AMENDMENT 4)

3.14.4 Reporting

- a. Soil stockpile and sample results as-built: Upon completion of the work the Contractor shall submit an as-built drawing presenting the approximate location where stockpiles were generated and corresponding sample results.
- b. Base personnel will be responsible for notifying the Nevada Division of Environmental Protection, Corrective Actions Bureau if more than 3 cubic yards of contaminated soil is encountered.

3.15 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

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SECTION 02763A

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SECTION 02763A

PAVEMENT MARKINGS

04/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 247 (1981; R 1996) Glass Beads Used in Traffic
Paint

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-B-1325 (Rev C; Notice 1; Canc. Notice 2) Beads
(Glass Spheres) Retro-Reflective (Metric)

FS TT-P-1952 (Rev D; Canc. Notice 1) Paint, Traffic and
Airfield Marking, Waterborne (Metric)

FED-STD-595 Colors

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment; G-AE

Lists of proposed equipment, including descriptive data, and notifications of proposed Contractor actions as specified in this section. List of removal equipment shall include descriptive data indicating area of coverage per pass, pressure adjustment range, tank and flow capacities, and safety precautions required for the equipment operation.

Composition Requirements; G-AE

Manufacturer's current printed product description and Material Safety Data Sheets (MSDS) for each type paint/color proposed for use.

Qualifications; G-AE

Document certifying that personnel are qualified for equipment operation and handling of chemicals.

SD-06 Test Reports

Sampling and Testing; G-AE

Certified copies of the test reports, prior to the use of the materials at the jobsite. Testing shall be performed in an approved independent laboratory.

SD-07 Certificates

Volatile Organic Compound (VOC); G-AE

Certificate stating that the proposed pavement marking paint meets the VOC regulations of the local Air Pollution Control District having jurisdiction over the geographical area in which the project is located.

1.3 DELIVERY AND STORAGE

All materials shall be delivered and stored in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's name, and directions, all of which shall be plainly legible at time of use.

1.4 EQUIPMENT

All machines, tools and equipment used in the performance of the work shall be approved and maintained in satisfactory operating condition. Equipment operating on roads and runways shall display low speed traffic markings and traffic warning lights.

1.4.1 Paint Application Equipment

The equipment to apply paint to pavements shall be a self-propelled or mobile-drawn pneumatic spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. The machine shall have a speed during application not less than 5 mph, and shall be capable of applying the stripe widths indicated, at the paint coverage rate specified in paragraph APPLICATION, and of even uniform thickness with clear-cut edges. The equipment used to apply the paint binder to airfield pavements shall be a self-propelled or mobile-drawn pneumatic spraying machine with an arrangement of atomizing nozzles capable of applying a line width at any one time in multiples of 6 inches, from 6 inches to 36 inches. The paint applicator shall have paint reservoirs or tanks of sufficient capacity and suitable gauges to apply paint in accordance with requirements specified. Tanks shall be equipped with suitable air-driven mechanical agitators. The spray mechanism shall be equipped with quick-action valves conveniently located, and shall include necessary pressure regulators and gauges in full view and reach of the operator. Paint strainers shall be installed in paint supply lines to ensure freedom from residue and foreign matter that may cause malfunction of the spray guns. The paint applicator shall be readily adaptable for attachment of an air-actuated dispenser for the reflective media approved for use. Pneumatic spray guns shall be provided for hand application of paint in areas where the mobile paint applicator cannot be used.

1.4.2 Reflective Media Dispenser

The dispenser for applying the reflective media shall be attached to the paint dispenser and shall operate automatically and simultaneously with the applicator through the same control mechanism. The dispenser shall be capable of adjustment and designed to provide uniform flow of reflective media over the full length and width of the stripe at the rate of coverage specified in paragraph APPLICATION, at all operating speeds of the applicator to which it is attached.

1.4.3 Surface Preparation Equipment

1.4.3.1 Sandblasting Equipment

Sandblasting equipment shall include an air compressor, hoses, and nozzles of proper size and capacity as required for cleaning surfaces to be painted. The compressor shall be capable of furnishing not less than 150 cfm of air at a pressure of not less than 90 psi at each nozzle used, and shall be equipped with traps that will maintain the compressed air free of oil and water.

1.4.3.2 Waterblast Equipment

The water pressure shall be specified at 2600 psi at 140 degrees F in order to adequately clean the surfaces to be marked.

1.4.4 Marking Removal Equipment

Equipment shall be mounted on rubber tires and shall be capable of removing markings from the pavement without damaging the pavement surface or joint sealant. Waterblasting equipment shall be capable of producing an adjustable, pressurized stream of water. Sandblasting equipment shall include an air compressor, hoses, and nozzles. The compressor shall be equipped with traps to maintain the air free of oil and water.

1.5 HAND-OPERATED, PUSH-TYPE MACHINES

All machines, tools, and equipment used in performance of the work shall be approved and maintained in satisfactory operating condition. Hand-operated push-type machines of a type commonly used for application of paint to pavement surfaces will be acceptable for marking small roads and parking areas. Applicator machine shall be equipped with the necessary paint tanks and spraying nozzles, and shall be capable of applying paint uniformly at coverage specified. Sandblasting equipment shall be provided as required for cleaning surfaces to be painted. Hand-operated spray guns shall be provided for use in areas where push-type machines cannot be used.

1.6 MAINTENANCE OF TRAFFIC

1.6.1 Airfield

The performance of work in the controlled zones of airfields shall be coordinated with the Contracting Officer and with the Flight Operations Officer. Verbal communications shall be maintained with the control tower before and during work in the controlled zones of the airfield. The control tower shall be advised when the work is completed. A radio for this purpose shall be provided by the Contractor and approved by the Contracting Officer.

1.6.2 Roads, Streets, and Parking Areas

When traffic must be rerouted or controlled to accomplish the work, the necessary warning signs, flagpersons, and related equipment for the safe passage of vehicles shall be provided.

1.7 WEATHER LIMITATIONS FOR REMOVAL

Pavement surface shall be free of snow, ice, or slush. Surface temperature shall be at least 40 degrees F and rising at the beginning of operations, except those involving shot or sand blasting. Operation shall cease during thunderstorms. Operation shall cease during rainfall, except for waterblasting and removal of previously applied chemicals. Waterblasting shall cease where surface water accumulation alters the effectiveness of material removal.

PART 2 PRODUCTS

2.1 PAINT

The paint shall be homogeneous, easily stirred to smooth consistency, and shall show no hard settlement or other objectionable characteristics during a storage period of 6 months. Paints for airfields, roads, and streets shall conform to FS TT-P-1952, color as indicated. Colors shall match Federal Standard FED-STD-595 color chip numbers as follows: 37925 (white), 33538 (yellow), and 33136 (red). Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.

2.2 REFLECTIVE MEDIA

Reflective media for airfields shall conform to FS TT-B-1325, Type I, Gradation A. Reflective media for roads shall conform to FS TT-B-1325, Type I, Gradation A or AASHTO M 247, Type I.

2.3 SAMPLING AND TESTING

Materials proposed for use shall be stored on the project site in sealed and labeled containers, or segregated at source of supply, sufficiently in advance of needs to allow 60 days for testing. Upon notification by the Contractor that the material is at the site or source of supply, a sample shall be taken by random selection from sealed containers by the Contractor in the presence of a representative of the Contracting Officer. Samples shall be clearly identified by designated name, specification number, batch number, manufacturer's formulation number, project contract number, intended use, and quantity involved. Testing shall be performed in an approved independent laboratory. If materials are approved based on reports furnished by the Contractor, samples will be retained by the Government for possible future testing should the material appear defective during or after application.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Surfaces to be marked shall be thoroughly cleaned before application of the pavement marking material. Dust, dirt, and other granular surface deposits

shall be removed by sweeping, blowing with compressed air, rinsing with water or a combination of these methods as required. Rubber deposits, surface laitance, existing paint markings, and other coatings adhering to the pavement shall be completely removed with scrapers, wire brushes, sandblasting, approved chemicals, or mechanical abrasion as directed. Areas of old pavement affected with oil or grease shall be scrubbed with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinsed thoroughly after each application. After cleaning, oil-soaked areas shall be sealed with cut shellac to prevent bleeding through the new paint. Pavement surfaces shall be allowed to dry, when water is used for cleaning, prior to striping or marking. Surfaces shall be recleaned, when work has been stopped due to rain.

3.1.1 Pretreatment for Early Painting

Where early painting is required on rigid pavements, a pretreatment with an aqueous solution containing 3 percent phosphoric acid and 2 percent zinc chloride shall be applied to prepared pavement areas prior to painting.

3.1.2 Cleaning Existing Pavement Markings

In general, markings shall not be placed over existing pavement marking patterns. Remove existing pavement markings as indicated on the project drawings. Existing pavement markings, which are in good condition but interfere or conflict with the newly applied marking patterns, shall be removed. Deteriorated or obscured markings that are not shown to be removed and are not misleading or confusing or interfere with the adhesion of the new marking material do not require removal. Whenever grinding, scraping, sandblasting or other operations are performed the work must be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that is misleading or confusing. When these operations are completed the pavement surface shall be swept to remove residue and debris resulting from the cleaning work.

3.1.3 Cleaning Concrete Curing Compounds

On new Portland cement concrete pavements, cleaning operations shall not begin until a minimum of 30 days after the placement of concrete. All new concrete pavements shall be cleaned by either sandblasting or water blasting. The extent of the blasting work shall be to clean and prepare the concrete surface as follows:

a. There is no visible evidence of curing compound on the peaks of the textured concrete surface.

b. There are no heavy puddled deposits of curing compound in the valleys of the textured concrete surface.

c. All remaining curing compound is intact; all loose and flaking material is removed.

d. The peaks of the textured pavement surface are rounded in profile and free of sharp edges and irregularities.

e. The surface to be marked is dry.

3.2 APPLICATION

All pavement markings and patterns shall be placed as shown on the plans.

3.2.1 Paint

Paint shall be applied to clean, dry surfaces, and only when air and pavement temperatures are above 40 degrees F and less than 95 degrees F. Paint temperature shall be maintained within these same limits. New asphalt pavement surfaces and new Portland concrete cement shall be allowed to cure for a period of not less than 30 days before applications of paint.

Paint shall be applied pneumatically with approved equipment at rate of coverage specified. The Contractor shall provide guide lines and templates as necessary to control paint application. Special precautions shall be taken in marking numbers, letters, and symbols. Edges of markings shall be sharply outlined.

3.2.1.1 Rate of Application

a. Reflective Markings: Pigmented binder shall be applied evenly to the pavement area to be coated at a rate of 105 plus or minus 5 square feet per gallon. Glass spheres shall be applied uniformly to the wet paint on airfield pavement at a rate of 8 and on roads and POL pavement at a rate of 6 plus or minus 0.5 pounds of glass spheres per gallon of paint.

b. Nonreflective Markings: Paint shall be applied evenly to the pavement surface to be coated at a rate of 105 plus or minus 5 square feet per gallon.

3.2.1.2 Drying

The maximum drying time requirements of the paint specifications will be strictly enforced to prevent undue softening of bitumen, and pickup, displacement, or discoloration by tires of traffic. If there is a delay in drying of the markings, painting operations shall be discontinued until cause of the slow drying is determined and corrected.

3.2.2 Reflective Media

Application of reflective media shall immediately follow application of pigmented binder. Drop-on application of glass spheres shall be accomplished to insure that reflective media is evenly distributed at the specified rate of coverage. Should there be malfunction of either paint applicator or reflective media dispenser, operations shall be discontinued immediately until deficiency is corrected.

3.3 MARKING REMOVAL

Pavement marking, shall be removed in the areas shown on the drawings. Removal of marking shall be as complete as possible without damage to the surface. Aggregate shall not be exposed by the removal process. After the markings are removed, the cleaned pavement surfaces shall exhibit adequate texture for remarking as specified in paragraph SURFACE PREPARATION. Contractor shall demonstrate removal of pavement marking in an area designated by the Contracting Officer. The demonstration area will become the standard for the remainder of the work.

3.3.1 Equipment Operation

Equipment shall be controlled and operated to remove markings from the pavement surface, prevent dilution or removal of binder from underlying pavement, and prevent emission of blue smoke from asphalt or tar surfaces.

3.3.2 Cleanup and Waste Disposal

The worksite shall be kept clean of debris and waste from the removal operations. Cleanup shall immediately follow removal operations in areas subject to air traffic. Debris shall be disposed of at approved sites.

3.3.3 Marking Damage

(AMENDMENT 4) The Contractor shall replace all pavement markings disturbed during demolition of apron or road pavement. Markings shall match the demolished markings. (AMENDMENT 4)

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09/98

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1.1 (AMENDMENT 4) Specification is not required. (AMENDMENT 4)

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SECTION 08331A

METAL ROLLING COUNTER DOORS

09/98

PART 1 GENERAL

1.1 (AMENDMENT 4) Specification is not required. (AMENDMENT 4)

-- End of Section --

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04/99; Rev. 12/00

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SECTION 15899

SYSTEM START-UP, FUELING SYSTEM
04/99; Rev. 12/00

PART 1 GENERAL

Waiver to Use MilStds and MilSpecs in Air Force Fuel Projects, HQ
AFCESA/CESM (01/29/96).

ATTACHMENTS: Checklist for Equipment Test

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

System Start-up Plan; G-AE.

The Contractor shall submit a detailed written plan prepared by the system supplier for implementation of system start-up. The plan shall be submitted for Government approval 60 days prior to system start-up. The plan shall include a list of personnel by trade, list of key personnel, safety equipment, list of miscellaneous equipment such as two-way radios personnel transportation vehicles etc. and detailed procedures and schedules. The Contractor and system supplier shall be responsible for implementing system start-up in coordination with ongoing base operations.

SD-06 Test Reports

Test Reports; G-AE

Submit written test reports to the Contracting Officer prior to the final acceptance procedure. Information reported shall include:

- a. Elapsed operating time.
- b. Tank liquid level readings.
- c. System flow rate and meter readings.
- d. System pressure gage readings.
- e. Number identification of pumps running.
- f. Pump RPM, amperage, and voltage.
- g. Condition of fuel samples.
- h. Hydrant control valve performance (including flow rate and pressure) during emergency shutoff, downstream valve closure, and relief operation.

Final Reports;

A final report shall be submitted which will include the final settings of the valves and switches and a copy of the strip chart graphs or equivalent with an explanation of what the graph indicates and what the system is doing.

SD-11 Closeout Submittals

Certification of Entire System; G-AE

Prior to the acceptance of the newly constructed system by the Government, all installed mechanical and electrical equipment shall be inspected and approved by the Contracting Officer. The Contractor shall give the Contracting Officer 30 days notice in order to schedule the Command Fuel Facilities Engineer and the Command Fuels Management Officer (who will act only as a technical consultants to the Contracting Officer and shall not have any contract authority) for participation in the inspection and equipment tests and final acceptance procedures and approval. Any deficiencies observed shall be corrected by the Contractor without cost to the Government.

PART 2 PRODUCTS

2.1 DESIGN CONDITIONS

Temporary flushing lines and equipment shall be equal in strength, stability, and materials to the associated permanent components. However, spools may be carbon steel. Additional design conditions shall be as specified in Section 15050 MECHANICAL EQUIPMENT, FUELING.

2.2 SOURCES OF MATERIAL AND EQUIPMENT

2.2.1 Material and Equipment

The Contractor shall provide material, equipment and labor not specified to be Government-furnished and required for proper start-up of the system. Equipment shall include but not be limited to the following:

- a. Temporary strainers.
- b. Pipe spools.
- c. Flow meters.
- d. Pressure gages.
- e. Electronic sensors for pressure and flow recording. This equipment shall be used to monitor and record, utilizing the trending software specified in Section 15970, the system during the "Equipment Test" and "Performance Testing" portions of this Specification Section. Recorded data shall be used by the Contractor and equipment factory representatives to achieve final control valve and equipment adjustments. Hard copy of the recorded data shall be turned over to the government after startup. Recorded data shall include:
 - (1) Fueling pumps discharge pressures.
 - (2) Supply Venturi flow rates.
 - (3) Hydrant Control Valve pressures.
 - (4) Back Pressure Control Valve upstream pressures.
 - (5) Back Pressure Control Valve downstream pressures.
 - (6) Return Venturi flow rates.

f. The Contractor must have on hand sufficient filter elements and coalescer cartridges to adequately clean the system. During cleaning operation, Contractor shall provide a flow versus pressure drop graph for each filter separator. Graph format shall be as shown at end of this Section. Contractor shall change coalescers and cartridges upon reaching a differential pressure of 15 psi or when pressure drop is less than previous graph or fails to increase properly. Isolate each filter separator, one at a time and use one fueling pump to obtain rated flow rate (600 GPM). A minimum of one complete set of coaleser elements and separator cartridges for each filter separator shall be turned over to the Government after new coalescer elements and separator cartridges are installed in each filter separator vessel after completion of acceptance testing.

2.2.2 Government-Furnished Material and Equipment

The Government will furnish the following materials, equipment and services during the performance of the work under this section.

2.2.2.1 Aircraft Turbine Fuel

The Government will provide the fuel necessary for system testing. The Contractor shall notify the Contracting Officer a minimum of sixty(60) days in advance of the requirements. Additional fuel will be provided by the Government as required for satisfactory flushing of the system. Upon satisfactory completion of the flushing and cleaning operations, the Government will supply the additional quantities of fuel required to complete the other work under this section. Fuel will not be delivered to the system until the Contractor has satisfactorily completed all work and, in particular, the cleaning and coating of the interior surfaces of the operating storage tanks and the removal of preservatives and foreign matter from those portions coming in contact with the fuel valves, pumps, filter separators and other such equipment. Fuel delivered to the system shall remain the property of the Government and the Contractor shall reimburse the Government for shortages not attributable to normal handling losses. The Government shall be reimbursed for fuel lost as a result of defective materials or workmanship. An empty Operating Tank shall never be filled at a velocity greater than 3-feet per second in the fill line until fuel is 3-feet above the fill nozzle.

2.2.2.2 Tank Trucks

Refueler tank trucks and operation of same will be furnished by the Government.

2.2.2.3 Hydrant Hose Trucks

The Government will furnish and operate the hydrant hose trucks required for ground refueling and defueling of aircraft at hydrant pits.

2.2.2.4 Utilities

Electric power required for the performance of the work under this section will be furnished at no charge to the Contractor.

PART 3 EXECUTION

3.1 PREPARATIONS FOR FLUSHING

Upon completion of the system to the satisfaction of the Contracting Officer and the Command Fuel Facilities Engineer, the Contractor shall make the following preparations for flushing the system.

3.1.1 Protection of Equipment

The following items shall be removed from the system prior to start of flushing operations and, where applicable, replaced with spools of pipe, diameter equal to the item removed.

- a. Control valves, including hydrant pit control valves if flushing outlets into tank trucks.
- b. Sensors which are exposed to the fluid.
- c. Coalescer and separator elements in filter separators.
- d. Venturi Tubes and Pressure Indicating Transmitters.
- e. Meter.

After flushing, the above items shall be reinstalled in the system and the spool sections turned over to the Contracting Officer.

3.1.2 Strainers

Temporary 40 mesh cone type strainers shall be installed in the suction line ahead of each fueling pump for first pass only. Any damaged strainers shall be replaced by the Contractor at no additional cost to the Government.

3.1.3 Water Draw-off

Remove any accumulated water from Operating Tanks' sumps and bottoms.

3.2 FLUSHING

Flushing procedures shall precede cleaning procedures. The transfer line, pump house piping, apron loop, supply and return lines to the operating tanks, hydrant laterals, product recovery lines and hydrant hose truck checkout station lines shall be flushed with fuel until the fuel being delivered is free of construction debris to the satisfaction of the Contracting Officer. Samples of fuel shall be taken and tested by the designated government agency and shall be free of gross contamination, maximum of 8.0 mg/gallon solids and free water not to exceed 2 ml per quart.

3.2.1 Fueling System Piping

The flushing of apron system pipelines shall be accomplished by pumping fuel from one of the operating tanks through the fueling system piping and back to another tank. Air shall be bled from system high points. The procedure shall be continued until the fuel being delivered into the tanks is acceptable to the Contracting Officer. After the system has been flushed to the satisfaction of the Contracting Officer, the Contractor shall remove any water remaining in the low point drains and remove any accumulated water from Operating Tank sumps and bottoms by means of the Water Draw-off systems. Cone strainers shall be kept clean in order to insure maximum flow rate. Upon completion of the first flushing operations, the cone strainers shall be removed from the system. In addition, baskets from all strainers shall be removed and cleaned.

3.2.1.1 Transfer Line

Flushing of the transfer line shall occur during the filling operations. Samples of the incoming fuel shall be taken at the point of connection with bulk storage supply line. These samples shall be taken at one hour intervals and shall be tested by the designated government agency and turned over to the Contracting Officer.

3.2.1.2 Pump House Piping

Remove equipment as specified in paragraph Protection of Equipment. Perform the following flushing operations by withdrawing fuel from one operating tank and returning it to another tank. Circulate a sufficient amount of fuel for each operation. Bleed air from high points.

- a. Position manual valves to circulate fuel through one pump, filter separator combination.
- b. Provide a temporary connection between the hydrant hose truck checkout connection and the single point receptacle. Position manual valves to circulate fuel through the checkout connection and back to the transfer line. Flush the checkout lines using one fueling pump.
- c. Position manual valves to circulate fuel through the bypass line. Flush this line using two fueling pumps.

3.2.1.3 Apron Loop Piping

Remove equipment as specified in paragraph Protection of Equipment. Position manual valves to circulate fuel through the apron loop and back to the operating tank. Begin flushing the apron loop at a flow rate of 600 gpm. Increase flushing flow rate one pump at a time to the maximum available number of pumps for a minimum of 8 hours.

3.2.1.4 Hydrant Outlets

Position a tank truck at the hydrant outlet and flush each hydrant lateral. Sample the fuel at the connection to the truck.

3.2.1.5 Product Recovery Tank Lines

During the flushing of apron loop piping, operate all manual drain lines individually to flush their connection to the product recovery tank. Fill the tank a minimum three times, each time utilizing the fuel transfer pump to drain it by returning the fuel to storage.

3.3 CLEANING

After initial flushing is completed, the pump house and apron loop piping shall be cleaned in accordance with the procedure specified hereafter. Operating Tanks shall be isolated from system and cleaned as specified in Section 15177 PETROLEUM TANK CLEANING. The Product Recovery Tank shall have an in-line sample taken from the bottom. If the particulate content exceeds 8 mg/gal the tank must be pumped down and visually inspected to determine need for cleaning. If required, clean per Section 15177.

3.3.1 Preparation for Cleaning

Filter elements shall be installed in the filter separators. Adjust filter separator flow control valve. Valves and equipment removed for flushing shall be reinstalled. Cone strainers shall be removed. Operating Tanks shall be drained, vapor freed and cleaned. Transfer the contents from one operating tank to the other for the purposes of cleaning.

3.3.2 Cleaning Requirements

Cleaning shall continue until Contracting Officer certifies that the fuel passes the color and particle assessment method as defined in T.O. 42B-1-1 or contains 2 milligrams per gallon or less of particulate. Fuel shall also contain 10 parts per million or less of free water. Sampling and testing shall be done by the Air Force. Also take samples at Hydrant Hose Truck Check-out Station and the truck fill stand.

3.3.3 Cleaning Procedure

During cleaning procedure periodically bleed air through high point vent and drain water through low point drains.

3.3.3.1 Transfer Line

Continue to receive fuel and circulate it until fuel samples taken at the tanks meet the requirements of paragraph 3.3.2.

3.3.3.2 Pump House Piping

Pump house piping shall be cleaned as follows:

- a. Position manual valves so that fuel is withdrawn from one operating tank, circulated through one fueling pump and filter separator, then returned to the operating tank through the receiving filter separators.
- b. Clean the piping system using one pump at a time. Alternate the fueling pumps and filter separators during the operation to clean the individual fueling pump suction and discharge lines.
- c. Provide a temporary connection between the hydrant hose truck connection and the nozzle adaptor. Position valves to circulate fuel through the checkout connection and back to the return line. Clean the checkout lines using two fueling pumps.
- d. Connect truck fill station to a tank truck and clean the line.
- e. Monitor pressure drop through the filter separators during each cleaning operation and provide flow vs. pressure drop graphs as specified herein before.
- f. Periodically take samples from all sample connections. Cleaning shall continue until the fuel meets the specified requirements.

3.3.3.3 Apron Loop Piping

Apron loop piping shall be cleaned as follows:

- a. Position manual valves to circulate fuel through the apron loop and

back to the operating tank through the receiving filter separators.

b. Initially pump fuel through the apron loop at a flow rate of 600 gpm, then increase flow rate up to the full capacity (all pumps running) starting manually one pump at a time. When pumping at a rate greater than 1200 gpm, by-pass receiving filter separators.

c. Monitor pressure drop through the filter separators during the cleaning operation and provide flow vs. pressure drop graphs as specified herein before.

d. Position a tank truck at the hydrant outlet and clean each hydrant lateral, one at a time.

e. Periodically take samples from all sample connections. Cleaning shall continue until the fuel meets specified requirements of paragraph 3.3.2.

3.3.3.4 Product Recovery Lines

Repeat the process described under initial flushing until samples taken at the connection of the pipe line back to storage meet the requirements.

3.4 CONTROL VALVE ADJUSTMENT

All control valve settings shall be checked and field adjusted from the factory settings at start-up as necessary to provide a smooth operation. The filter separator control valves and fueling pump non-surge check valve shall be checked and adjusted as follows:

3.4.1 Rate of Flow Control Feature on Fueling Pump Non-Surge Check Valve

Run one pump at a time and adjust rate of flow feature (650 gpm).

3.4.2 Control Valves on Issue Filter Separator Downstream Side

a. Position valves so that one fueling pump can pump through only one filter separator. Close the valve at the entrance of the apron loop, and open the bypass valve, allowing discharge into the circulating line.

b. Start the pump and adjust the filter separator control valve for the rated flow capacity of the filter separator (600 gpm).

c. Repeat above for each remaining filter separator.

3.5 EQUIPMENT TESTS

After completion of flushing, cleaning, and control valve and electrical components adjusting operations, the tests specified hereinafter shall be performed. After cleaning is complete and prior to performance testing, field adjustment of automatic control valves and automatic pump controls while in operation shall be made only by the valve manufacturer's authorized field test engineer. For final adjustment of installed electrical control equipment the Contractor shall provide an experienced electrical engineer, factory representative of PCP manufacturer and factory representative of PIT and DPT manufacturers. Both the mechanical and electrical components shall be adjusted concurrently. Tests will be witnessed by the Contracting Officer, the Command Fuel Facilities Engineer and the Command Fuel Management Officer. Contractor shall complete and

submit to Contracting Officer the "CHECK LIST FOR EQUIPMENT TEST" provided hereinafter.

3.5.1 Operating Tank Low Level Alarm

Position valves to transfer fuel between operating tanks. Start one fueling pump and pump sufficient fuel out of the first operating tank to allow the low level alarm (LLA) to stop the fueling pump. This procedure shall be repeated for each fueling pump and each tank until the low level alarm stops the fueling pump due to low liquid level in operating tank.

3.5.2 Fuel Delivery

Deliver fuel to each fueling point against a backpressure at the outlet of the hydrant control valve created by the tank trucks and hoses used during the tests. The flow rate shall be not less than 600 gallons per minute for a 4-inch valve. The flow rate shall be not less than 1200 gallons per minute for a 6-inch valve. Flow rates might be affected by aircraft capability.

3.5.3 Fueling Pump Operation

Operation of all pressure and flow devices to start and stop the fueling pumps at the indicated pressure and flow rates shall be demonstrated by the Contractor in the presence of the Contracting Officer. The operating sequence shall be repeated with each of the pumps being selected as lead pump. For this test, the flow rates shall be measured. Flow rates and test results shall be recorded and witnessed by the Contractor.

3.5.4 Defueling Performance

To test the defueling operation in the "automatic" mode, the Government will furnish a defueling cart or a hydrant hose truck with a 300 gpm pump rated at 165 psi to pump fuel from a government furnished tank truck or bladder back into the system. While this defueling test is in operation, one 600 gpm transfer pump shall be operated providing flow into a tank truck through one hydrant control valve. Demonstrate capability of defueling into the system at the same time a fueling operation is in progress. Also test the defuel capability while in the "Flush" mode.

3.5.5 Emergency Shutdown

With one fueling pump circulating fuel through the system, test each "Emergency Stop" pushbutton station to verify that the pump stops and the emergency shutoff valves CV-1 through CV-5 close. Repeat above procedure for each fueling pump and "Emergency Stop" pushbutton station. Conduct tests for both the automatic and manual modes. With all the fueling pumps circulating fuel through the system, push an "Emergency Stop" pushbutton station.

3.5.6 Hydrant Control Valve

Each Hydrant Control Valve shall be operated to demonstrate the following:

- a. Surge shut-down capability. (Surge from shut-off of on-board aircraft fill valve can be simulated by closing a fill line valve to the tank truck or bladder, use a three (3) second closure.)
- b. Pressure control at setpoint, + 2 psi (Requires use of a pressure gage at the pressure fueling nozzle).

3.5.7 Filter Separator Float Control Valves with Manual Tester

Using the manual float control test level on each Filter Separator, lift the weight from the float ball slowly and observe the following:

Operation and closure of the water slug shut-off feature on the Filter Separator Control Valve.

3.5.8 Overfill Valve

Place fuel transfer pump in the "off" position. Delivery quantity of fuel to Product Recovery Tank to demonstrate capability of valve to close. Place Fuel Transfer Pump in the "Automatic" position to demonstrate capability of valve to open when fuel level drops below set point.

3.6 PERFORMANCE TESTING

Testing as performed under the above paragraphs shall be considered to be part of the performance testing after the Contractor has made the required adjustments to the various equipment and controls and demonstrates to the satisfaction of the Contracting Officer and the Command Fuel Facilities Engineer that these portions of the systems are working as specified. The Contractor shall notify the Contracting Officer 15 calendar days in advance of the test to permit arrangement for the use of Government-furnished items.

(AMENDMENT 4) During the time period of final performance testing, no construction activities will be allowed on the project site. The project site shall be considered an operational (fuel) zone (versus a construction zone) during this final performance testing period. Personnel, dressed for fuel's operation, will be present to witness testing and participate in contractor provided training. (AMENDMENT 4)

3.6.1 Final Performance Test

The final performance test shall consist of performance of the fueling system during actual fueling and defueling of an aircraft. The maximum rated capacity of the system shall be tested by using several aircraft simultaneously. If it is not possible to use the number of aircraft required to receive the full flow, the test shall be supplemented through the use of refueling trucks or bladders. Record required data necessary to prepare "Test Reports" specified in paragraph Test Reports.

3.6.1.1 Satisfactory Performance

In the event a portion of the system or any piece of equipment fails to meet the test, the Contractor shall make the necessary repairs or adjustments and repeat the Performance Test until satisfactory performance is obtained. The determination of satisfactory performance shall be made by the Contracting Officer and the Command Fuel Facilities Engineer.

3.6.2 Final Acceptance

The system shall be filled with fuel and shall be operable and leak-free prior to acceptance. Anything wet with fuel is considered to be leaking.

3.6.2.1 Operating Tank High Liquid Level Shut-Off Valve Test and Adjustments

During the final filling of operating tanks, the tank automatic high liquid level shut-off valve shall be checked for proper functioning at least three times by lowering the fuel level and refilling again. Adjust valve to achieve a safe fill level.

3.6.2.2 Tank Level Indicator Adjustments

Also during the final filling of operating tanks, adjust and calibrate the tank level indicators including the final setting of the high high level (HHLA) and high level (HLA) alarms. Since the HHLA is at a point higher than the High Liquid Level Shut-Off Valve float set point, an artificial method of simulating HHL must be used.

3.6.2.3 Water Draw-Off System Test

During the performance testing, Water Draw-off Systems shall be filled from Operating Tank sump to ensure proper operation. After filling system, allow time for fuel/water mixture to separate. Verify liquid separation through system's sight glasses. Proper operation includes capability to drain separated water and capability to pump separated fuel back to a full Operating Tank.

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ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C119.1	(1986; R 1997) Sealed Insulated Underground Connector Systems Rated 600 Volts
ANSI C12.10	(1997) Electromechanical Watthour Meters
ANSI C12.11	(1987; R 1993) Instrument Transformers for Revenue Metering, 10 kV BIL through 350 kV BIL (0.6 kV NSV through 69 kV NSV)
ANSI C12.4	(1984; R 1996) Mechanical Demand Registers
ANSI C135.30	(1988) Zinc-Coated Ferrous Ground Rods for Overhead or Underground Line Construction
ANSI C29.1	(1988; R 1996) Electrical Power Insulators - Test Methods
ANSI C37.121	(1989; R 1995) Switchgear, Unit Substations Requirements
ANSI C37.16	(2000) Low-Voltage Power Circuit Breakers and AC Power Circuit Protectors - Preferred Ratings, Related Requirements, and Application Recommendations
ANSI C37.46	(1981; R 1992) Power Fuses and Fuse Disconnecting Switches
ANSI C37.50	(1989; R 1995) Switchgear, Low-Voltage AC Power Circuit Breakers Used in Enclosures - Test Procedures
ANSI C37.72	(1987) Manually-Operated, Dead-Front Padmounted Switchgear with Load Interrupting Switches and Separable Connectors for Alternating-Current Systems
ANSI C57.12.13	(1982) Conformance Requirements for Liquid-Filled Transformers Used in Unit Installations, Including Unit Substations

ANSI C57.12.21	(1995) Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Single-Phase Distribution Transformers with High-Voltage Bushings; (High-Voltage, 34 500 Grd Y/19 920 Volts and Below; Low-Voltage, 240/120; 167 kVA and Smaller)
ANSI C57.12.26	(1993) Pad-Mounted Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers for Use with Separable Insulated High-Voltage Connectors, High-Voltage, 34 500 Grd Y/19 920 Volts and Below; 2500 kVA and Smaller
ANSI C57.12.27	(1982) Conformance Requirements for Liquid-Filled Distribution Transformers Used in Pad-Mounted Installations, Including Unit Substations
ANSI C57.12.28	(1999) Switchgear and Transformers - Padmounted Equipment - Enclosure Integrity
ANSI C80.1	(1995) Rigid Steel Conduit - Zinc Coated
ANSI O5.1	(1992) Specifications and Dimensions for Wood Poles

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123/A 123M	(2001) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153/A 153M	(2001) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 48	(1994ae1) Gray Iron Castings
ASTM A 48M	(1994e1) Gray Iron Castings (Metric)
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM B 231/B 231M	(1999) Concentric-Lay-Stranded Aluminum 1350 Conductors
ASTM B 3	(1995) Soft or Annealed Copper Wire
ASTM B 400	(1994) Compact Round Concentric-Lay-Stranded Aluminum 1350 Conductor
ASTM B 496	(1999) Compact Round Concentric-Lay-Stranded Copper Conductors
ASTM B 609/B 609M	(1999) Aluminum 1350 Round Wire, Annealed and Intermediate Tempers, for Electrical purposes
ASTM B 8	(1999) Concentric-Lay-Stranded Copper

	Conductors, Hard, Medium-Hard, or Soft
ASTM B 800	(2000) 8000 Series Aluminum Alloy Wire for Electrical Purposes-Annealed and Intermediate Tempers
ASTM B 801	(1999) Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy for Subsequent Covering or Insulation
ASTM C 478	(1997) Precast Reinforced Concrete Manhole Sections
ASTM C 478M	(1997) Precast Reinforced Concrete Manhole Sections (Metric)
ASTM D 1654	(1992) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D 2472	(2000) Sulfur Hexafluoride
ASTM D 4059	(1996) Analysis of Polychlorinated Biphenyls in Insulating Liquids by Gas Chromatography
ASTM D 923	(1997) Sampling Electrical Insulating Liquids

ASSOCIATION OF EDISON ILLUMINATING COMPANIES (AEIC)

AEIC CS5	(1994; CS5a-1995) Cross-Linked Polyethylene Insulated Shielded Power Cables Rated 5 Through 46 kV
AEIC CS6	(1996) Ethylene Propylene Rubber Insulated Shielded Power Cables Rated 5 Through 69 kV

FACTORY MUTUAL ENGINEERING AND RESEARCH (FM)

FM P7825a	(1998) Approval Guide Fire Protection
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INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	(1997) National Electrical Safety Code
IEEE C37.1	(1994) IEEE Standard Definition, Specification, and Analysis of Systems Used for Supervisory Control, Data Acquisition, and Automatic Control
IEEE C37.13	(1990; R 1995) Low-Voltage AC Power Circuit Breakers Used in Enclosures
IEEE C37.2	(1996) Electrical Power System Device Function Numbers and Contact Designations
IEEE C37.20.1	(1993) Metal-Enclosed Low-Voltage Power Circuit-Breaker Switchgear

IEEE C37.20.2	(1993; C37.20.2b) Metal-Clad and Station-Type Cubicle Switchgear
IEEE C37.20.3	(1997) Metal-Enclosed Interrupter Switchgear
IEEE C37.23	(1987; R 1991) Guide for Metal-Enclosed Bus and Calculating Losses in Isolated-Phase Bus
IEEE C37.30	(1997) Requirements for High-Voltage Switches
IEEE C37.34	(1994) Test Code for High-Voltage Air Switches
IEEE C37.41	(1994; C37.41c) Design Tests for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories
IEEE C37.63	(1997) Requirements for Overhead, Pad-Mounted, Dry-Vault, and Submersible Automatic Line Sectionalizer for AC Systems
IEEE C37.90	(1989; R 1994) Relays and Relay Systems Associated with Electric Power Apparatus
IEEE C37.90.1	(1989; R 1994) IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems
IEEE C37.98	(1987; R 1991) Seismic Testing of Relays
IEEE C57.12.00	(1993) Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEE C57.13	(1993) Instrument Transformers
IEEE C57.98	(1993) Guide for Transformer Impulse Tests \\\\$avail only as part of Distribution, Power, and Regulating Transformers Stds Collection
IEEE C62.1	(1989; R 1994) Surge Arresters for AC Power Circuits
IEEE C62.11	(1999) IEEE Standard Metal-Oxide Surge Arresters for AC Power Circuits
IEEE C62.2	(1987; R 1994) Guide for the Application of Gapped Silicon-Carbide Surge Arresters for Alternating Current Systems
IEEE Std 100	(1997) IEEE Standard Dictionary of Electrical and Electronics Terms

IEEE Std 242	(1986; R 1991) Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems
IEEE Std 386	(1995) Separable Insulated Connector Systems for Power Distribution Systems Above 600V
IEEE Std 399	(1997) Recommended Practice for Industrial and Commercial Power Systems Analysis
IEEE Std 404	(1993) Cable Joints for Use with Extruded Dielectric Cable Rated 5000 V Through 138 000 V and Cable Joints for Use with Laminated Dielectric Cable Rated 2500 V Through 500 000 V
IEEE Std 48	(1998) Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV through 765 kV
IEEE Std 592	(1990; R 1996) Exposed Semiconducting Shields on Premolded High Voltage Cable Joints and Separable Insulated Connectors
IEEE Std 81	(1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System (Part 1) \F31.00\F

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA AB 1	(1993) Molded Case Circuit Breakers and Molded Case Switches
NEMA BU 1	(1994) Busways
NEMA FB 1	(1993) Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
NEMA FU 1	(1986) Low Voltage Cartridge Fuses
NEMA LA 1	(1992) Surge Arresters
NEMA PB 1	(1995) Panelboards
NEMA PB 2	(1995) Deadfront Distribution Switchboards
NEMA SG 2	(1993) High Voltage Fuses
NEMA SG 3	(1995) Power Switching Equipment
NEMA SG 5	(1995) Power Switchgear Assemblies
NEMA TC 5	(1990) Corrugated Polyolefin Coilable Plastic Utilities Duct
NEMA TC 6	(1990) PVC and ABS Plastic Utilities Duct

for Underground Installation

- NEMA TC 7 (1990) Smooth-Wall Coilable Polyethylene Electrical Plastic Duct
- NEMA WC 7 (1988; Rev 3 1996) Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
- NEMA WC 8 (1988; Rev 3 1996) Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 70 (2002) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

- UL 1072 (1995; Rev Mar 1998) Medium Voltage Power Cables
- UL 1242 (1996; Rev Mar 1998) Intermediate Metal Conduit
- UL 1684 (2000) Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
- UL 198C (1986; Rev thru Feb 1998) High-Interrupting-Capacity Fuses, Current-Limiting Types
- UL 198D (1995) Class K Fuses
- UL 198E (1988; Rev Jul 1988) Class R Fuses
- UL 198H (1988; Rev thru Nov 1993) Class T Fuses
- UL 467 (1993; Rev thru Apr 1999) Grounding and Bonding Equipment
- UL 486A (1997; Rev thru Dec 1998) Wire Connectors and Soldering Lugs for Use with Copper Conductors
- UL 486B (1997; Rev Jun 1997) Wire Connectors for Use with Aluminum Conductors
- UL 489 (1996; Rev thru Dec 1998) Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures
- UL 510 (1994; Rev thru Apr 1998) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
- UL 514A (1996; Rev Dec 1999) Metallic Outlet Boxes

UL 6	(1997) Rigid Metal Conduit
UL 651	(1995; Rev thru Oct 1998) Schedule 40 and 80 Rigid PVC Conduit
UL 854	(1996; Rev Oct 1999) Service-Entrance Cables
UL 857	(1994; Rev thru Dec 1999) Busways and Associated Fittings

1.2 GENERAL REQUIREMENTS

1.2.1 Terminology

Terminology used in this specification is as defined in IEEE Std 100.

1.2.2 Service Conditions

Items provided under this section shall be specifically suitable for the following service conditions. Seismic details shall

- b. Altitude 2162 feet
- c. Ambient Temperature 120 degrees F

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Electrical Distribution System; G-AE,

Detail drawings consisting of equipment drawings, illustrations, schedules, instructions, diagrams manufacturers standard installation drawings and other information necessary to define the installation and enable the Government to check conformity with the requirements of the contract drawings.

If departures from the contract drawings are deemed necessary by the Contractor, complete details of such departures shall be included with the detail drawings. Approved departures shall be made at no additional cost to the Government.

Detail drawings shall show how components are assembled, function together and how they will be installed on the project. Data and drawings for component parts of an item or system shall be coordinated and submitted as a unit. Data and drawings shall be coordinated and included in a single submission. Multiple submissions for the same equipment or system are not acceptable except where prior approval has been obtained from the Contracting

Officer. In such cases, a list of data to be submitted later shall be included with the first submission. Detail drawings shall consist of the following:

a. Detail drawings showing physical arrangement, construction details, connections, finishes, materials used in fabrication, provisions for conduit or busway entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and equipment weight. Drawings shall be drawn to scale and/or dimensioned. All optional items shall be clearly identified as included or excluded.

b. Internal wiring diagrams of equipment showing wiring as actually provided for this project. External wiring connections shall be clearly identified.

Detail drawings shall as a minimum depict the installation of the following items:

a. Medium-voltage cables and accessories including cable installation plan.

b. Transformers.

c. SF6 insulated pad-mounted switchgear.

d. Surge arresters.

As-Built Drawings; G-AE

The as-built drawings shall be a record of the construction as installed. The drawings shall include the information shown on the contract drawings as well as deviations, modifications, and changes from the contract drawings, however minor. The as-built drawings shall be a full sized set of prints marked to reflect deviations, modifications, and changes. The as-built drawings shall be complete and show the location, size, dimensions, part identification, and other information. Additional sheets may be added. The as-built drawings shall be jointly inspected for accuracy and completeness by the Contractor's quality control representative and by the Contracting Officer prior to the submission of each monthly pay estimate. Upon completion of the work, the Contractor shall provide three full sized sets of the marked prints to the Contracting Officer for approval. If upon review, the as-built drawings are found to contain errors and/or omissions, they will be returned to the Contractor for correction.

The Contractor shall correct and return the as-built drawings to the Contracting Officer for approval within 10 calendar days from the time the drawings are returned to the Contractor.

SD-03 Product Data

Nameplates; G-AE

Catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents.

Material and Equipment

A complete itemized listing of equipment and materials proposed for incorporation into the work. Each entry shall include an item number, the quantity of items proposed, and the name of the manufacturer of each such item.

General Installation Requirements; G-AE

As a minimum, installation procedures for transformers, switchgear, and medium-voltage cable terminations and splices.

Procedures shall include cable pulling plans, diagrams, instructions, and precautions required to install, adjust, calibrate, and test the devices and equipment.

SD-06 Test Reports

Factory Tests; G-AE

Certified factory test reports shall be submitted when the manufacturer performs routine factory tests, including tests required by standards listed in paragraph REFERENCES. Results of factory tests performed shall be certified by the manufacturer, or an approved testing laboratory, and submitted within 7 days following successful completion of the tests. The manufacturer's pass-fail criteria for tests specified in paragraph FIELD TESTING shall be included.

Field Testing; G-AE

A proposed field test plan, 20 days prior to testing the installed system. No field test shall be performed until the test plan is approved. The test plan shall consist of complete field test procedures including tests to be performed, test equipment required, and tolerance limits.

Operating Tests; G-AE

Six copies of the information described below in 8-1/2 by 11 inch binders having a minimum of three rings, including a separate section for each test. Sections shall be separated by heavy plastic dividers with tabs.

- a. A list of equipment used, with calibration certifications.
- b. A copy of measurements taken.
- c. The dates of testing.
- d. The equipment and values to be verified.
- e. The condition specified for the test.
- f. The test results, signed and dated.
- g. A description of adjustments made.

Cable Installation; G-AE,

Six copies of the information described below in 8-1/2 by 11 inch

binders having a minimum of three rings from which material may readily be removed and replaced, including a separate section for each cable pull. Sections shall be separated by heavy plastic dividers with tabs, with all data sheets signed and dated by the person supervising the pull.

- a. Site layout drawing with cable pulls numerically identified.
- b. A list of equipment used, with calibration certifications. The manufacturer and quantity of lubricant used on pull.
- c. The cable manufacturer and type of cable.
- d. The dates of cable pulls, time of day, and ambient temperature.
- e. The length of cable pull and calculated cable pulling tensions.
- f. The actual cable pulling tensions encountered during pull.

SD-07 Certificates

Material and Equipment; G-AE

Where materials or equipment are specified to conform to the standards of the Underwriters Laboratories (UL) or to be constructed or tested, or both, in accordance with the standards of the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers (IEEE), or the National Electrical Manufacturers Association (NEMA), the Contractor shall submit proof that the items provided conform to such requirements. The label of, or listing by, UL will be acceptable as evidence that the items conform. Either a certification or a published catalog specification data statement, to the effect that the item is in accordance with the referenced ANSI or IEEE standard, will be acceptable as evidence that the item conforms. A similar certification or published catalog specification data statement to the effect that the item is in accordance with the referenced NEMA standard, by a company listed as a member company of NEMA, will be acceptable as evidence that the item conforms. In lieu of such certification or published data, the Contractor may submit a certificate from a recognized testing agency equipped and competent to perform such services, stating that the items have been tested and that they conform to the requirements listed, including methods of testing of the specified agencies. Compliance with above-named requirements does not relieve the Contractor from compliance with any other requirements of the specifications.

Cable Joints; G-AE

A certification that contains the names and the qualifications of people recommended to perform the splicing and termination of medium-voltage cables approved for installation under this contract. The certification shall indicate that any person recommended to perform actual splicing and terminations has been adequately trained in the proper techniques and have had at least three recent years of experience in splicing and terminating the

same or similar types of cables approved for installation. In addition, any person recommended by the Contractor may be required to perform a practice splice and termination, in the presence of the Contracting Officer, before being approved as a qualified installer of medium-voltage cables. If that additional requirement is imposed, the Contractor shall provide short sections of the approved types of cables along with the approved type of splice and termination kits, and detailed manufacturer's instruction for the proper splicing and termination of the approved cable types.

Cable Installer Qualifications; G-AE

The Contractor shall provide at least one onsite person in a supervisory position with a documentable level of competency and experience to supervise all cable pulling operations. A resume shall be provided showing the cable installers' experience in the last three years, including a list of references complete with points of contact, addresses and telephone numbers.

SD-10 Operation and Maintenance Data

Electrical Distribution System; G-AE

Six copies of operation and maintenance manuals, within 7 calendar days following the completion of tests and including assembly, installation, operation and maintenance instructions, spare parts data which provides supplier name, current cost, catalog order number, and a recommended list of spare parts to be stocked. Manuals shall also include data outlining detailed procedures for system startup and operation, and a troubleshooting guide which lists possible operational problems and corrective action to be taken. A brief description of all equipment, basic operating features, and routine maintenance requirements shall also be included. Documents shall be bound in a binder marked or identified on the spine and front cover. A table of contents page shall be included and marked with pertinent contract information and contents of the manual. Tabs shall be provided to separate different types of documents, such as catalog ordering information, drawings, instructions, and spare parts data. Index sheets shall be provided for each section of the manual when warranted by the quantity of documents included under separate tabs or dividers.

Three additional copies of the instructions manual shall be provided within 30 calendar days following the manuals.

1.4 DELIVERY, STORAGE, AND HANDLING

Devices and equipment shall be visually inspected by the Contractor when received and prior to acceptance from conveyance. Stored items shall be protected from the environment in accordance with the manufacturer's published instructions. Damaged items shall be replaced. Oil filled transformers and switches shall be stored in accordance with the manufacturer's requirements. Metal poles shall be handled and stored in accordance with the manufacturer's instructions.

1.5 EXTRA MATERIALS

One additional spare fuse or fuse element for each furnished fuse or fuse element shall be delivered to the contracting officer when the electrical system is accepted. Two complete sets of all special tools required for maintenance shall be provided, complete with a suitable tool box. Special tools are those that only the manufacturer provides, for special purposes (to access compartments, or operate, adjust, or maintain special parts).

PART 2 PRODUCTS

2.1 STANDARD PRODUCT

Material and equipment shall be the standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Items of the same classification shall be identical including equipment, assemblies, parts, and components.

2.2 NAMEPLATES

2.2.1 General

Each major component of this specification shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a nameplate securely attached to the equipment. Nameplates shall be made of noncorrosive metal. Equipment containing liquid dielectrics shall have the type of dielectric on the nameplate. Sectionalizer switch nameplates shall have a schematic with all switch positions shown and labeled. As a minimum, nameplates shall be provided for transformers, circuit breakers, meters, switches, and switchgear.

2.2.2 Liquid-Filled Transformer Nameplates

Power transformers shall be provided with nameplate information in accordance with IEEE C57.12.00. Nameplates shall indicate the number of gallons and composition of liquid-dielectric, and shall be permanently marked with a statement that the transformer dielectric to be supplied is non-polychlorinated biphenyl. If transformer nameplate is not so marked, the Contractor shall furnish manufacturer's certification for each transformer that the dielectric is non-PCB classified, with less than 2 ppm PCB content in accordance with paragraph LIQUID DIELECTRICS. Certifications shall be related to serial numbers on transformer nameplates. Transformer dielectric exceeding the 2 ppm PCB content or transformers without certification will be considered as PCB insulated and will not be accepted.

2.3 CORROSION PROTECTION

2.3.1 Aluminum Materials

Aluminum shall not be used.

2.3.2 Ferrous Metal Materials

2.3.2.1 Hardware

Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A 153/A 153M and ASTM A 123/A 123M.

2.3.2.2 Equipment

Equipment and component items, including but not limited to transformer stations and ferrous metal luminaries not hot-dip galvanized or porcelain enamel finished, shall be provided with corrosion-resistant finishes which shall withstand 120 hours of exposure to the salt spray test specified in ASTM B 117 without loss of paint or release of adhesion of the paint primer coat to the metal surface in excess of 1/16 inch from the test mark. The scribed test mark and test evaluation shall be in accordance with ASTM D 1654 with a rating of not less than 7 in accordance with TABLE 1, (procedure A). Cut edges or otherwise damaged surfaces of hot-dip galvanized sheet steel or mill galvanized sheet steel shall be coated with a zinc rich paint conforming to the manufacturer's standard.

2.3.3 Finishing

Painting required for surfaces not otherwise specified and finish painting of items only primed at the factory shall be as specified in Section 09900 PAINTS AND COATINGS.

2.4 CABLES

Cables shall be single conductor type unless otherwise indicated.

2.4.1 Medium-Voltage Cables

2.4.1.1 General

Cable construction shall be Type MV, conforming to NFPA 70 and UL 1072 . Cables shall be manufactured for use in duct applications.

2.4.1.2 Ratings

Cables shall be rated for a circuit voltage of 15 kV.

2.4.1.3 Conductor Material

Underground cables shall be soft drawn copper complying with ASTM B 3 and ASTM B 8 for regular concentric and compressed stranding or ASTM B 496 for compact stranding.

2.4.1.4 Insulation

Cable insulation shall be ethylene-propylene-rubber (EPR) insulation conforming to the requirements of NEMA WC 8 and AEIC CS6. A 133 percent insulation level shall be used on 5 kV, 15 kV and 25 kV rated cables. The Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS.

2.4.1.5 Shielding

Cables rated for 2 kV and above shall have a semiconducting conductor shield, a semiconducting insulation shield, and an overall copper tape shield for each phase.

2.4.1.6 Neutrals

Neutral conductors of shall be copper, employing the same insulation and

jacket materials as phase conductors, except that a 600-volt insulation rating is acceptable.

2.4.1.7 Jackets

Cables shall be provided with a polyethylene jacket. Direct buried cables shall be rated for direct burial.

2.4.2 Low-Voltage Cables

Cables shall be rated 600 volts and shall conform to the requirements of NFPA 70, and must be UL listed for the application or meet the applicable section of either ICEA or NEMA standards.

2.4.2.1 Conductor Material

Underground cables shall be annealed copper complying with ASTM B 3 and ASTM B 8. Intermixing of copper and aluminum conductors is not permitted.

2.4.2.2 Insulation

Insulation must be in accordance with NFPA 70, and must be UL listed for the application or meet the applicable sections of either ICEA, or NEMA standards.

2.4.2.3 Jackets

Multiconductor cables shall have an overall PVC outer jacket.

2.4.2.4 In Duct

Cables shall be single-conductor cable, in accordance with NFPA 70.

2.5 CABLE JOINTS, TERMINATIONS, AND CONNECTORS

2.5.1 Medium-Voltage Cable Joints

Medium-voltage cable joints shall comply with IEEE Std 404 and IEEE Std 592.

Medium-voltage cable terminations shall comply with IEEE Std 48. Joints shall be the standard products of a manufacturer and shall be either of the factory preformed type or of the kit type containing tapes and other required parts. Joints shall have ratings not less than the ratings of the cables on which they are installed. Splice kits may be of the heat-shrinkable type for voltages up to 15 kV, of the premolded splice and connector type, the conventional taped type, or the resin pressure-filled overcast taped type for voltages up to 35 kV; except that for voltages of 7.5 kV or less a resin pressure-filled type utilizing a plastic-tape mold is acceptable. Joints used in manholes, handholes, vaults and pull boxes shall be certified by the manufacturer for waterproof, submersible applications.

2.5.2 Medium-Voltage Separable Insulated Connectors

Separable insulated connectors shall comply with IEEE Std 386 and IEEE Std 592 and shall be of suitable construction or standard splice kits shall be used. Separable insulated connectors are acceptable for voltages up to 35 kV. Connectors shall be of the loadbreak type as indicated, of suitable construction for the application and the type of cable connected, and shall include cable shield adaptors. Separable insulated connectors shall not be

used as substitutes for conventional permanent splices. External clamping points and test points shall be provided.

2.5.3 Low-Voltage Cable Splices

Low-voltage cable splices and terminations shall be rated at not less than 600 Volts. Splices in conductors No. 10 AWG and smaller shall be made with an insulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A. Splices in conductors No. 8 AWG and larger shall be made with noninsulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A and UL 486B.

Splices shall then be covered with an insulation and jacket material equivalent to the conductor insulation and jacket. Splices below grade or in wet locations shall be sealed type conforming to ANSI C119.1 or shall be waterproofed by a sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring a thermosetting resin into a mold that surrounds the joined conductors.

2.5.4 Terminations

Terminations shall be in accordance with IEEE Std 48, Class 1 or Class 2; of the molded elastomer, wet-process porcelain, prestretched elastomer, heat-shrinkable elastomer, or taped type. Acceptable elastomers are track-resistant silicone rubber or track-resistant ethylene propylene compounds, such as ethylene propylene rubber or ethylene propylene diene monomer. Separable insulated connectors may be used for apparatus terminations, when such apparatus is provided with suitable bushings. Terminations shall be of the outdoor type, except that where installed inside outdoor equipment housings which are sealed against normal infiltration of moisture and outside air, indoor, Class 2 terminations are acceptable. Class 3 terminations are not acceptable. Terminations, where required, shall be provided with mounting brackets suitable for the intended installation and with grounding provisions for the cable shielding, metallic sheath, and armor.

2.5.4.1 Factory Preformed Type

Molded elastomer, wet-process porcelain, prestretched, and heat-shrinkable terminations shall utilize factory preformed components to the maximum extent practicable rather than tape build-up. Terminations shall have basic impulse levels as required for the system voltage level.

2.5.4.2 Taped Terminations

Taped terminations shall use standard termination kits providing terminal connectors, field-fabricated stress cones, and rain hoods. Terminations shall be at least 20 inches long from the end of the tapered cable jacket to the start of the terminal connector, or not less than the kit manufacturer's recommendations, whichever is greater.

2.6 CONDUIT AND DUCTS

Duct lines shall be concrete-encased, thin-wall type for duct lines between manholes and for other medium-voltage lines. Low-voltage lines run elsewhere may be direct-burial, thick-wall type.

2.6.1 Metallic Conduit

Intermediate metal conduit shall comply with UL 1242. Rigid galvanized

steel conduit shall comply with UL 6 and ANSI C80.1. Metallic conduit fittings and outlets shall comply with UL 514A and NEMA FB 1.

2.6.2 Nonmetallic Ducts

2.6.2.1 Concrete Encased Ducts

UL 651 Schedule 40 or NEMA TC 6 Type EB.

2.6.2.2 Direct Burial

UL 651 Schedule 80.

2.6.3 Conduit Sealing Compound

Compounds for sealing ducts and conduit shall have a putty-like consistency workable with the hands at temperatures as low as 35 degrees F, shall neither slump at a temperature of 300 degrees F, nor harden materially when exposed to the air. Compounds shall adhere to clean surfaces of fiber or plastic ducts; metallic conduits or conduit coatings; concrete, masonry, or lead; any cable sheaths, jackets, covers, or insulation materials; and the common metals. Compounds shall form a seal without dissolving, noticeably changing characteristics, or removing any of the ingredients. Compounds shall have no injurious effect upon the hands of workmen or upon materials.

2.7 MANHOLES, HANDHOLES, AND PULLBOXES

Manholes, handholes, and pullboxes shall be as indicated. Strength of manholes, handholes, and pullboxes and their frames and covers shall conform to the requirements of IEEE C2. Precast-concrete manholes shall have the required strength established by ASTM C 478, ASTM C 478M. Frames and covers shall be made of gray cast iron and a machine-finished seat shall be provided to ensure a matching joint between frame and cover. Cast iron shall comply with ASTM A 48, Class 30B, minimum. Handholes for low voltage cables installed in parking lots, sidewalks, and turfed areas shall be fabricated from an aggregate consisting of sand and with continuous woven glass strands having an overall compressive strength of at least 10,000 psi and a flexural strength of at least 5,000 psi. Pullbox and handhole covers in sidewalks, and turfed areas shall be of the same material as the box. Concrete pullboxes shall consist of precast reinforced concrete boxes, extensions, bases, and covers.

2.8 TRANSFORMERS AND SWITCHGEAR

Transformers and switchgear shall be of the outdoor type having the ratings and arrangements indicated. Medium-voltage ratings of cable terminations shall be 15 kV between phases for 133 percent insulation level.

2.8.1 Pad-Mounted Transformers

Pad-mounted transformers shall comply with ANSI C57.12.26 and shall be of the loop feed type. Pad-mounted transformer stations shall be assembled and coordinated by one manufacturer and each transformer station shall be shipped as a complete unit so that field installation requirements are limited to mounting each unit on a concrete pad and connecting it to primary and secondary lines. Stainless steel pins and hinges shall be provided. Barriers shall be provided between high- and low-voltage compartments. High-voltage compartment doors shall be interlocked with low-voltage compartment doors to prevent access to any high-voltage section

unless its associated low-voltage section door has first been opened. Compartments shall be sized to meet the specific dimensional requirements of ANSI C57.12.26. Pentahead locking bolts shall be provided with provisions for a padlock.

2.8.1.1 High-Voltage Compartments

The high-voltage compartment shall be dead-front construction. Primary switching and protective devices shall include loadbreak switching, oil-immersed, current-limiting, bayonet-type fuses, medium-voltage separable loadbreak connectors, universal bushing wells and inserts or integral one piece bushings and surge arresters. Fuses shall comply with the requirements of paragraph METERING AND PROTECTIVE DEVICES. The switch shall be mounted inside transformer tank with switch operating handle located in high-voltage compartment and equipped with metal loop for hook stick operation. Fuses shall be interlocked with switches so that fuses can be removed only when the associated switch is in the "OPEN" position. Adjacent to medium-voltage cable connections, a nameplate or equivalent stencilled inscription shall be provided inscribed "DO NOT OPEN CABLE CONNECTORS UNLESS SWITCH IS OPEN." Surge arresters shall be fully insulated and configured to terminate on a second set of high voltage bushings.

2.8.1.2 Load-Break Switch

Provide one radial-feed oil-immersed type 4-way switch rated at 15 kV, 95 kV BIL, with a continuous current rating and load-break rating of 200 ampere, and a make-and-latch rating of 10,000 rms amperes symmetrical. Locate the switch handle in the high-voltage compartment.

2.8.1.3 Transformer Tank Sections

Transformers shall comply with IEEE C57.12.00, ANSI C57.12.21, and ANSI C57.12.26 and shall be of the mineral oil-insulated type. Transformers shall be suitable for outdoor use and shall have 2 separate windings per phase. Standard NEMA primary taps shall be provided. Where primary taps are not specified, 4, 2-1/2 percent rated kVA high-voltage taps shall be provided 2 above and 2 below below rated, primary voltage. Operating handles for primary tap changers for de-energized operation shall be located within high-voltage compartments, externally to transformer tanks. Adjacent to the tap changer operating handle, a nameplate or equivalent stencilled inscription shall be provided and inscribed "DO NOT OPERATE UNDER LOAD." Transformer ratings at 60 Hz shall be as follows:

- Three-phase capacity..... (AMENDMENT 4) 300
(AMENDMENT 4) kVA.
- Impedance.....5.75%.
- Temperature Rise.....65 degrees C.
- High-voltage winding.....12,470 volts.
- High-voltage winding connections.....delta.
- Low-voltage winding.....480/277 volts.
- Low-voltage winding connections..... wye

2.8.1.4 Low-Voltage Cable Compartments

Neutrals shall be provided with fully-insulated bushings. Clamp type cable terminations, suitable for copper conductors entering from below, shall be provided as necessary.

2.8.1.5 Accessories

High-voltage warning signs shall be permanently attached to each side of transformer stations. Voltage warning signs shall comply with IEEE C2. Copper-faced steel or stainless steel ground connection pads shall be provided in both the high- and low-voltage compartments. Dial-type thermometer, liquid-level gauge, and drain valve with built-in sampling device shall be provided for each transformer station. Insulated-bushing-type parking stands shall be provided adjacent to each separable load-break elbow to provide for cable isolation during sectionalizing operations.

2.8.2 Pad-Mounted, Metal-Enclosed, Switchgear

The switchgear shall be configured with one incoming compartment for radial-feed, equipped with oil-insulated, load-interrupter switches, as indicated. The outgoing compartments shall be provided with fused disconnects, as indicated.

2.8.2.1 Ratings at 60 Hz shall be:

Nominal voltage (kV).....	15.5.
Rated maximum voltage (kV).....	15.5.
Rated continuous current (A).....	600.
Maximum symmetrical interrupting capacity (kA).....	10.
Maximum asymmetrical interrupting capacity (kA).....	16.
Three-second short-time current-carrying capacity (kA).....	10.
BIL (kV).....	95.

2.8.2.2 Operators, Devices, and Controls

Operators and controls shall be provided for the switchgear as follows:

- a. Switches shall be provided with a manual, handle-type operator or a push-button mechanical spring tripping mechanism, utilizing a stored-energy (spring-driven) mechanism to simultaneously open or close all phases. The switchgear shall be configured so that the switch actuator is padlockable, but may be accessed without opening the switch compartment doors.
- b. Fused disconnects shall be hook-stick operated.

2.8.2.3 Enclosures

Switchgear enclosures shall be of freestanding, self-supporting

construction provided with separate incoming and outgoing compartments configured for bottom cable entry. Enclosures shall be of deadfront construction, provided with a hinged door for access to each compartment, and conform to the requirements of ANSI C57.12.28, ANSI C37.72, and IEEE C37.20.3, Category A.

2.9 METERING AND PROTECTIVE DEVICES

2.9.1 Fuses, Medium-Voltage, Including Current-Limiting

2.9.2.1 Construction

Units shall be suitable for outdoor use. Fuses shall have integral blown-fuse indicators. All ratings shall be clearly visible.

2.9.1.2 Ratings

Current-limiting power fuses shall have ratings in accordance with ANSI C37.46 .

2.9.1.3 E-Rated, Current-Limiting Power Fuses

E-rated, current-limiting, power fuses shall conform to ANSI C37.46.

2.9.1.4 C-Rated, Current-Limiting Power Fuses

C-rated, current-limiting power fuses shall open in 1000 seconds at currents between 170 and 240 percent of the C rating.

2.9.2 Fuses, Low-Voltage, Including Current-Limiting

Low-voltage fuses shall conform to NEMA FU 1. Time delay and nontime delay options shall be as specified. Equipment provided under this contract shall be provided with a complete set of properly rated fuses when the equipment manufacturer utilizes fuses in the manufacture of the equipment, or if current-limiting fuses are required to be installed to limit the ampere-interrupting capacity of circuit breakers or equipment to less than the maximum available fault current at the location of the equipment to be installed. Fuses shall have a voltage rating of not less than the phase-to-phase circuit voltage, and shall have the time-current characteristics required for effective power system coordination.

2.9.2.1 Cartridge Fuses

Cartridge fuses, current-limiting type, Class RK1 RK5 shall have tested interrupting capacity not less than 100,000 amperes. Fuse holders shall be the type that will reject Class H fuses.

2.9.2 Transformer Circuit Fuses

Transformer circuit fuses shall be Class RK1 or RK5, current-limiting, time-delay with 200,000 amperes interrupting capacity.

2.10 SURGE ARRESTERS

Surge arresters shall comply with NEMA LA 1, IEEE C62.1, IEEE C62.2, and IEEE C62.11 and shall be provided where indicated. Arresters shall be distribution class, rated as shown. Arresters for use at elevations in excess of 6000 feet above mean sea level shall be specifically rated for that purpose. Arresters shall be equipped with mounting brackets suitable for the indicated installations. Arresters shall be of the metal-oxide varistor type.

2.11 GROUNDING AND BONDING

2.11.1 Driven Ground Rods

Ground rods shall be copper-clad steel conforming to UL 467. Static ground rods shall be zinc-coated steel conforming to ANSI C135.30 and shall be 3/4 inch in diameter by 10 feet in length and shall be specifically installed as shown on the drawings. All other ground rods shall be not less than 3/4 inch in diameter by 8 feet in length. Sectional type rods may be used.

2.11.2 Grounding Conductors

Grounding conductors shall be bare, except where installed in conduit with associated phase conductors. Insulated conductors shall be of the same material as phase conductors and green color-coded, except that conductors shall be rated no more than 600 volts. Bare conductors shall be ASTM B 8 soft-drawn unless otherwise indicated. Aluminum is not acceptable.

2.12 CONCRETE AND REINFORCEMENT

Concrete work shall have minimum 3000 psi compressive strength and conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. Concrete reinforcing shall be as specified in Section 03200A CONCRETE REINFORCEMENT.

2.13 PADLOCKS

Padlocks shall comply with Section 08710 DOOR HARDWARE.

2.14 CABLE FIREPROOFING SYSTEMS

Cable fireproofing systems shall be listed in FM P7825a as a fire-protective coating or tape approved for grouped electrical conductors and shall be suitable for application on the type of medium-voltage cables provided. After being fully cured, materials shall be suitable for use where exposed to oil, water, gases, salt water, sewage, and fungus and shall not damage cable jackets or insulation. Asbestos materials are not acceptable.

2.14.1 Fireproof Coating

Cable fireproofing coatings shall be compounded of water-based thermoplastic resins, flame-retardant chemicals, and inorganic noncombustible fibers and shall be suitable for the application methods used. Coatings applied on bundled cables shall have a derating factor of less than 5 percent, and a dielectric strength of 95 volts per mil minimum after curing.

2.14.2 Fireproofing Tape

Fireproofing tape shall be at least 2 inches wide and shall be a flexible, conformable, polymeric, elastomer tape designed specifically for fireproofing cables.

2.14.3 Plastic Tape

Preapplication plastic tape shall be pressure sensitive, 10 mil thick, conforming to UL 510.

2.15 LIQUID DIELECTRICS

Liquid dielectrics for transformers and other liquid-filled electrical equipment shall be non-polychlorinated biphenyl (PCB) mineral-oil or less-flammable liquid as specified. Nonflammable fluids shall not be used.

Tetrachloroethylene (perchloroethylene) and 1, 2, 4 trichlorobenzene fluids shall not be used. Liquid dielectrics in retrofitted equipment shall be certified by the manufacturer as having less than 2 parts per million (ppm) PCB content. In lieu of the manufacturer's certification, the Contractor may submit a test sample of the dielectric in accordance with ASTM D 923 and have tests performed per ASTM D 4059 at a testing facility approved by the Contracting Officer. Equipment with test results indicating PCB level exceeding 2 ppm shall be replaced.

2.16 FACTORY TESTS

Factory tests shall be performed, as follows, in accordance with the applicable publications and with other requirements of these specifications. The Contracting Officer shall be notified at least 10 days before the equipment is ready for testing. The Contracting Officer reserves the right to witness the tests.

- a. Transformers: Manufacturer's standard design and other tests in accordance with IEEE C57.12.00.
- b. Transformers rated 200 kVA and above: Reduced full-wave, chopped-wave, and full-wave impulse test on each line and neutral terminal, in accordance with IEEE C57.98.
- c. Factory Preformed Terminations: Wet withstand voltage tests in accordance with IEEE Std 48 for the next higher BIL level.
- f. Outdoor Switchgear: Manufacturer's standard tests in accordance with IEEE C37.20.1, IEEE C37.20.2, and IEEE C37.20.3.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Equipment and devices shall be installed and energized in accordance with the manufacturer's published instructions. Steel conduits installed underground shall be installed and protected from corrosion in conformance with the requirements of Section 16415A ELECTRICAL WORK, INTERIOR. Except as covered herein, excavation, trenching, and backfilling shall conform to the requirements of Section 02316A EXCAVATION, TRENCHING, AND BACKFILLING

FOR UTILITIES SYSTEMS. Concrete work shall have minimum 3000 psi compressive strength and conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.1.1 Conformance to Codes

The installation shall comply with the requirements and recommendations of NFPA 70 and IEEE C2 as applicable.

3.1.2 Verification of Dimensions

The Contractor shall become familiar with details of the work, shall verify dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing any work.

3.1.3 Disposal of Liquid Dielectrics

PCB-contaminated dielectrics must be marked as PCB and transported to and incinerated by an approved EPA waste disposal facility. The Contractor shall furnish certification of proper disposal. Contaminated dielectrics shall not be diluted to lower the contamination level.

3.2 CABLE AND BUSWAY INSTALLATION

The Contractor shall obtain from the manufacturer an installation manual or set of instructions which addresses such aspects as cable construction, insulation type, cable diameter, bending radius, cable temperature, lubricants, coefficient of friction, conduit cleaning, storage procedures, moisture seals, testing for and purging moisture, etc. The Contractor shall then prepare a checklist of significant requirements perform pulling calculations and prepare a pulling plan which shall be submitted along with the manufacturers instructions in accordance with SUBMITTALS.

3.2.1 Cable Installation Plan and Procedure

Cable shall be installed strictly in accordance with the cable manufacturer's recommendations. Each circuit shall be identified by means of a fiber, laminated plastic, or non-ferrous metal tags, or approved equal, in each manhole, handhole, junction box, and each terminal. Each tag shall contain the following information; cable type, conductor size, circuit number, circuit voltage, cable destination and phase identification.

3.2.1.1 Cable Inspection

The cable reel shall be inspected for correct storage positions, signs of physical damage, and broken end seals. If end seal is broken, moisture shall be removed from cable in accordance with the cable manufacturer's recommendations.

3.2.1.2 Duct Cleaning

Duct shall be cleaned with an assembly that consists of a flexible mandrel (manufacturers standard product in lengths recommended for the specific size and type of duct) that is 1/4 inch less than inside diameter of duct, 2 wire brushes, and a rag. The cleaning assembly shall be pulled through conduit a minimum of 2 times or until less than a volume of 8 cubic inches of debris is expelled from the duct.

3.2.1.3 Duct Lubrication

The cable lubricant shall be compatible with the cable jacket for cable that is being installed. Application of lubricant shall be in accordance with lubricant manufacturer's recommendations.

3.2.1.4 Cable Installation

The Contractor shall provide a cable feeding truck and a cable pulling winch as required. The Contractor shall provide a pulling grip or pulling eye in accordance with cable manufacturer's recommendations. The pulling grip or pulling eye apparatus shall be attached to polypropylene or manilla rope followed by lubricant front end packs and then by power cables. A dynamometer shall be used to monitor pulling tension. Pulling tension shall not exceed cable manufacturer's recommendations. The Contractor shall not allow cables to cross over while cables are being fed into duct. For cable installation in cold weather, cables shall be kept at 50 degrees F temperature for at least 24 hours before installation.

3.2.1.5 Cable Installation Plan

The Contractor shall submit a cable installation plan for all cable pulls in accordance with the detail drawings portion of paragraph SUBMITTALS. Cable installation plan shall include:

- a. Site layout drawing with cable pulls identified in numeric order of expected pulling sequence and direction of cable pull.
- b. List of cable installation equipment.
- c. Lubricant manufacturer's application instructions.
- d. Procedure for resealing cable ends to prevent moisture from entering cable.
- e. Cable pulling tension calculations of all cable pulls.
- f. Cable percentage conduit fill.
- g. Cable sidewall thrust pressure.
- h. Cable minimum bend radius and minimum diameter of pulling wheels used.
- i. Cable jam ratio.
- j. Maximum allowable pulling tension on each different type and size of conductor.
- k. Maximum allowable pulling tension on pulling device.

3.2.2 Duct Line

Cables shall be installed in duct lines where indicated. Cable splices in low-voltage cables shall be made in manholes and handholes only, except as otherwise noted. Cable joints in medium-voltage cables shall be made in manholes or approved pullboxes only. Neutral and grounding conductors shall be installed in the same duct with their associated phase conductors.

3.2.3 Electric Manholes

Cables shall be routed around the interior walls and securely supported from walls on cables racks. Cable routing shall minimize cable crossover, provide access space for maintenance and installation of additional cables, and maintain cable separation in accordance with IEEE C2.

3.3 CABLE JOINTS

Medium-voltage cable joints shall be made by qualified cable splicers only. Qualifications of cable splicers shall be submitted in accordance with paragraph SUBMITTALS. Shields shall be applied as required to continue the shielding system through each entire cable joint. Shields may be integrally molded parts of preformed joints. Shields shall be grounded at each joint or in accordance with manufacturer's recommended practice. Cable joints shall provide insulation and jacket equivalent to that of the associated cable. Armored cable joints shall be enclosed in compound-filled, cast-iron or alloy, splice boxes equipped with stuffing boxes and armor clamps of a suitable type and size for the cable being installed.

3.4 FIREPROOFING

Each medium-voltage cable and conductor in manholes shall be fire-proofed for their entire length within the manhole. Where cables and conductors have been lubricated to enhance pulling into ducts, the lubricant shall be removed from cables and conductors exposed in the manhole before fireproofing.

3.4.1 Tape Method

Before application of fireproofing tape, plastic tape wrapping shall be applied over exposed metallic items such as the cable ground wire, metallic outer covering, or armor to minimize the possibility of corrosion from the fireproofing materials and moisture. Before applying fireproofing tape, irregularities of cables, such as at cable joints, shall be evened out with insulation putty. A flexible conformable polymeric elastomer fireproof tape shall be wrapped tightly around each cable spirally in 1/2 lapped wrapping or in 2 butt-jointed wrappings with the second wrapping covering the joints of the first.

3.4.2 Sprayable Method

Manholes shall be power ventilated until coatings are dry and dewatered and the coatings are cured. Ventilation requirements shall be in accordance with the manufacturer's instruction, but not less than 10 air changes per hour shall be provided. Cable coatings shall be applied by spray, brush, or glove to a wet film thickness that reduces to the dry film thickness approved for fireproofing by FM P7825a. Application methods and necessary safety precautions shall be in accordance with the manufacturers instructions. After application, cable coatings shall be dry to the touch in 1 to 2 hours and fully cured in 48 hours, except where the manufacturer has stated that because of unusual humidity or temperature, longer periods may be necessary.

3.5 DUCT LINES

3.5.1 Requirements

Numbers and sizes of ducts shall be as indicated. Duct lines shall be laid with a minimum slope of 4 inches per 100 feet. Depending on the contour of the finished grade, the high-point may be at a terminal, a manhole, a handhole, or between manholes or handholes. Short-radius manufactured 90-degree duct bends may be used only for pole or equipment risers, unless specifically indicated as acceptable. The minimum manufactured bend radius shall be 18 inches for ducts of less than 3 inch diameter, and 36 inches for ducts 3 inches or greater in diameter. Otherwise, long sweep bends having a minimum radius of 25 feet shall be used for a change of direction of more than 5 degrees, either horizontally or vertically. Both curved and straight sections may be used to form long sweep bends, but the maximum curve used shall be 30 degrees and manufactured bends shall be used. Ducts shall be provided with end bells whenever duct lines terminate in manholes or handholes. When power and telephone ducts cross each other, try to cross at right angles. Maintain a minimum separation of 3 inches of concrete or 12 inches of earth between the power and telephone ducts.

3.5.2 Treatment

Ducts shall be kept clean of concrete, dirt, or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun. All empty or spare ducts shall have 1/4-inch nylon pull ropes installed throughout the entire duct run. Provide a minimum of 10-inches of slack at each end of pull rope. Pull ropes shall have a minimum tensile strength of 200 pounds per square inch.

3.5.3 Concrete Encasement

Ducts requiring concrete encasements shall comply with NFPA 70, except that electrical duct bank configurations for ducts 6 inches in diameter shall be determined by calculation and as shown on the drawings. The separation between adjacent electric power and communication ducts shall conform to IEEE C2. Duct line encasements shall be monolithic construction. Where a connection is made to a previously poured encasement, the new encasement shall be well bonded or doweled to the existing encasement. The Contractor shall submit proposed bonding method for approval in accordance with the detail drawing portion of paragraph SUBMITTALS. At any point, except railroad and airfield crossings, tops of concrete encasements shall be not less than the cover requirements listed in NFPA 70, nor less than 24" when ducts run under or through hazardous areas. At railroad and airfield crossings, duct lines shall be encased with concrete and reinforced as indicated to withstand specified surface loadings. Tops of concrete encasements shall be not less than 5 feet below tops of rails or airfield paving unless otherwise indicated. Where ducts are jacked under existing pavement, rigid steel conduit will be installed because of its strength. To protect the corrosion-resistant conduit coating, predrilling or installing conduit inside a larger iron pipe sleeve (jack-and-sleeve) is required. For crossings of existing railroads and airfield pavements greater than 50 feet in length, the predrilling method or the

jack-and-sleeve method will be used. Separators or spacing blocks shall be made of steel, concrete, plastic, or a combination of these materials placed not farther apart than 4 feet on centers. Ducts shall be securely anchored to prevent movement during the placement of concrete and joints shall be staggered at least 6 inches vertically.

3.5.4 Nonencased Direct-Burial

Top of duct lines shall be below the frost line depth but not less than 24 inches below finished grade and shall be installed with a minimum of 3 inches of earth around each duct, except that between adjacent electric power and communication ducts, 12 inches of earth is required. Bottoms of trenches shall be graded toward manholes or handholes and shall be smooth and free of stones, soft spots, and sharp objects. Where bottoms of trenches comprise materials other than sand, a 3 inch layer of sand shall be laid first and compacted to approximate densities of surrounding firm soil before installing ducts. Joints in adjacent tiers of duct shall be vertically staggered at least 6 inches. The first 6 inch layer of backfill cover shall be sand compacted as previously specified. The rest of the excavation shall be backfilled and compacted in 3 to 6 inch layers. Duct banks may be held in alignment with earth. However, high-tiered banks shall use a wooden frame or equivalent form to hold ducts in alignment prior to backfilling. Do not install non-metallic duct under or running through hazardous locations.

3.5.5 Installation of Couplings

Joints in each type of duct shall be made up in accordance with the manufacturer's recommendations for the particular type of duct and coupling selected and as approved.

3.5.5.1 Plastic Duct

Duct joints shall be made by brushing a plastic solvent cement on insides of plastic coupling fittings and on outsides of duct ends. Each duct and fitting shall then be slipped together with a quick 1/4-turn twist to set the joint tightly.

3.5.6 Duct Line Markers

Duct line markers shall be provided at the ends of long duct line stubouts or for other ducts whose locations are indeterminate because of duct curvature or terminations at completely below-grade structures. In addition to markers, a 5 mil brightly colored plastic tape, not less than 3 inches in width and suitably inscribed at not more than 10 feet on centers with a continuous metallic backing and a corrosion-resistant 1 mil metallic foil core to permit easy location of the duct line, shall be placed approximately 12 inches below finished grade levels of such lines.

3.5.7 Special Requirements for Communications Duct Installation

Provide a cable warning tape over the duct lines. The cable warning tape shall be a minimum of 3 inch wide, orange in color, and suitable for buried applications. The warning tape shall be continuously imprinted with the words "WARNING - COMMUNICATIONS CABLE BELOW" at not more than 48 inch intervals and shall be placed 12 inches below finished grade levels of such lines to permit easy location of the duct line. A 1/4-inch nylon pull rope shall be installed in all empty duct runs. All ducts will be sealed with duct sealant.

3.6 MANHOLES, HANDHOLES, AND PULLBOXES

3.6.1 General

Manholes shall be constructed approximately where shown. The exact location of each manhole shall be determined after careful consideration has been given to the location of other utilities, grading, and paving. The location of each manhole shall be approved by the Contracting Officer before construction of the manhole is started. Manholes shall be the type noted on the drawings and shall be constructed in accordance with the applicable details as indicated. Top, walls, and bottom shall consist of reinforced concrete. Walls and bottom shall be of monolithic concrete construction. The Contractor may at his option utilize monolithically constructed precast-concrete manholes having the required strength and inside dimensions as required by the drawings or specifications. In paved areas, frames and covers for manhole and handhole entrances in vehicular traffic areas shall be flush with the finished surface of the paving. In unpaved areas, the top of manhole covers shall be approximately 1/2 inch above the finished grade. Where existing grades that are higher than finished grades are encountered, concrete assemblies designed for the purpose shall be installed to elevate temporarily the manhole cover to existing grade level. All duct lines entering manholes must be installed on compact soil or otherwise supported when entering a manhole to prevent shear stress on the duct at the point of entrance to the manhole. Duct lines entering cast-in-place concrete manholes shall be cast in-place with the manhole. Duct lines entering precast concrete manholes through a precast knockout penetration shall be grouted tight with a portland cement mortar. PVC duct lines entering precast manholes through a PVC endbell shall be solvent welded to the endbell. A cast metal grille-type sump frame and cover shall be installed over the manhole sump. A cable-pulling iron shall be installed in the wall opposite each duct line entrance.

3.6.2 Electric Manholes

Cables shall be securely supported from walls by hot-dip galvanized cable racks with a plastic coating over the galvanizing and equipped with adjustable hooks and insulators. The number of cable racks indicated shall be installed in each manhole and not less than 2 spare hooks shall be installed on each cable rack. Insulators shall be made of high-glazed porcelain. Insulators will not be required on spare hooks.

3.6.3 Handholes

Handholes shall be located approximately as shown. Handholes shall be of the type noted on the drawings and shall be constructed in accordance with the details shown.

3.6.4 Ground Rods

A ground rod shall be installed at the manholes, handholes and pullboxes. Ground rods shall be driven into the earth before the manhole floor is poured so that approximately 4 inches of the ground rod will extend above the manhole floor. When precast concrete manholes are used, the top of the ground rod may be below the manhole floor and a No. 1/0 AWG ground conductor brought into the manhole through a watertight sleeve in the manhole wall.

3.7 PAD-MOUNTED EQUIPMENT INSTALLATION

Pad-mounted equipment, shall be installed on concrete pads in accordance with the manufacturer's published, standard installation drawings and procedures, except that they shall be modified to meet the requirements of this document. Units shall be installed so that they do not damage equipment or scratch painted or coated surfaces. After installation, surfaces shall be inspected and scratches touched up with a paint or coating provided by the manufacturer especially for this purpose. Three-phase transformers shall be installed with abc phase sequence. Primary taps shall be set at 0%.

3.7.1 Concrete Pads

3.7.1.1 Construction

Concrete pads for pad-mounted electrical equipment may be either pre-fabricated or poured-in-place. Pads shall be constructed as indicated, except that exact pad dimensions and mounting details are equipment specific and are the responsibility of the Contractor. Tops of concrete pads shall be level and shall project 4 inches above finished paving or grade and sloped to drain. Edges of concrete pads shall have 3/4 inch chamfer. Conduits for primary, secondary, and grounding conductors shall be set in place prior to placement of concrete pads. Where grounding electrode conductors are installed through concrete pads, PVC conduit sleeves shall be installed through the concrete to provide physical protection. To facilitate cable installation and termination, the concrete pad shall be provided with a rectangular hole below the primary and secondary compartments, sized in accordance with the manufacturer's recommended dimensions. Upon completion of equipment installation the rectangular hole shall be filled with masonry grout.

3.7.1.2 Concrete and Reinforcement

Concrete work shall have minimum 3000 psi compressive strength and conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. Concrete pad reinforcement shall be in accordance with Section 03200A CONCRETE REINFORCEMENT.

3.7.1.3 Sealing

When the installation is complete, the Contractor shall seal all conduit and other entries into the equipment enclosure with an approved sealing compound. Seals shall be of sufficient strength and durability to protect all energized live parts of the equipment from rodents, insects, or other foreign matter.

3.7.2 Padlocks

Padlocks shall be provided for pad-mounted equipment and for each fence gate. Padlocks shall be keyed as directed by the Contracting Officer.

3.8 CONNECTIONS TO BUILDINGS

Cables shall be extended into the various buildings as indicated, and shall be connected to the first applicable termination point in each building. Interfacing with building interior conduit systems shall be at conduit stubouts terminating 5 feet outside of a building and 2 feet below finished grade as specified and provided under Section 16415A ELECTRICAL WORK,

INTERIOR. After installation of cables, conduits shall be sealed with caulking compound to prevent entrance of moisture or gases into buildings.

3.9 GROUNDING

A ground ring consisting of the indicated configuration of bare copper conductors and driven ground rods shall be installed around pad-mounted equipment as shown. Equipment frames of metal-enclosed equipment, and other noncurrent-carrying metal parts, such as cable shields, cable sheaths and armor, and metallic conduit shall be grounded. At least 2 connections shall be provided from a transformer AND a switchgear ground bus to the ground mat. Metallic frames and covers of handholes and pull boxes shall be grounded by use of a braided, copper ground strap with equivalent ampacity of No. 6 AWG.

3.9.1 Grounding Electrodes

Grounding electrodes shall be installed as shown on the drawings and as follows:

- a. Driven rod electrodes - Unless otherwise indicated, ground rods shall be driven into the earth until the tops of the rods are approximately 1 foot below finished grade.
- b. Ground ring - A ground ring shall be installed as shown consisting of bare copper conductors installed 18 inches, plus or minus 3 inches, below finished top of soil grade. Ground ring conductors shall be sized as shown.
- c. Additional electrodes - When the required ground resistance is not met, additional electrodes shall be provided interconnected with grounding conductors to achieve the specified ground resistance. The additional electrodes will be up to three, feet rods spaced a minimum of 10 feet apart. In high ground resistance, UL listed chemically charged ground rods may be used. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, the Contracting Officer shall be notified immediately.

3.9.2 Grounding and Bonding Connections

Connections above grade shall be made by the fusion-welding process or with bolted solderless connectors, in compliance with UL 467, and those below grade shall be made by a fusion-welding process. Where grounding conductors are connected to aluminum-composition conductors, specially treated or lined copper-to-aluminum connectors suitable for this purpose shall be used.

3.9.3 Grounding and Bonding Conductors

Grounding and bonding conductors include conductors used to bond transformer enclosures and equipment frames to the grounding electrode system. Grounding and bonding conductors shall be sized as shown, and located to provide maximum physical protection. Bends greater than 45 degrees in ground conductors are not permitted. Routing of ground conductors through concrete shall be avoided. When concrete penetration is necessary, nonmetallic conduit shall be cast flush with the points of concrete entrance and exit so as to provide an opening for the ground conductor, and the opening shall be sealed with a suitable compound after installation.

3.9.4 Surge Arrester Grounding

Surge arresters and neutrals shall be bonded directly to the transformer enclosure and then to the grounding electrode system with a bare copper conductor, sized as shown. Lead lengths shall be kept as short as practicable with no kinks or sharp bends.

3.9.5 Manhole, Handhole, or Concrete Pullbox Grounding

Ground rods installed in manholes, handholes, or concrete pullboxes shall be connected to cable racks, cable-pulling irons, the cable shielding, metallic sheath, and armor at each cable joint or splice by means of a No. 4 AWG braided tinned copper wire. Connections to metallic cable sheaths shall be by means of tinned terminals soldered to ground wires and to cable sheaths. Care shall be taken in soldering not to damage metallic cable sheaths or shields. Ground rods shall be protected with a double wrapping of pressure-sensitive plastic tape for a distance of 2 inches above and 6 inches below concrete penetrations. Grounding electrode conductors shall be neatly and firmly attached to manhole or handhole walls and the amount of exposed bare wire shall be held to a minimum.

3.10 FIELD TESTING

3.10.1 General

Field testing shall be performed in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer 2 days prior to conducting tests. The Contractor shall furnish all materials, labor, and equipment necessary to conduct field tests. The Contractor shall perform all tests and inspections recommended by the manufacturer unless specifically waived by the Contracting Officer. The Contractor shall maintain a written record of all tests which includes date, test performed, personnel involved, devices tested, serial number and name of test equipment, and test results. Field test reports shall be signed and dated by the Contractor.

3.10.2 Safety

The Contractor shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn personnel in the test vicinity. The Contractor shall replace any devices or equipment which are damaged due to improper test procedures or handling.

3.10.3 Ground-Resistance Tests

The resistance of each grounding electrode, each grounding electrode system and the ground ring shall be measured using the fall-of-potential method defined in IEEE Std 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

- a. Single rod electrode - 25 ohms.
- b. Multiple rod electrodes - 25 ohms.

- c. Ground ring - 25 ohms.

3.10.4 Medium-Voltage Cable Test

After installation and before the operating test or connection to an existing system, the medium-voltage cable system shall be given a high potential test. Direct-current voltage shall be applied on each phase conductor of the system by connecting conductors as one terminal and connecting grounds or metallic shieldings or sheaths of the cable as the other terminal for each test. Prior to making the test, the cables shall be isolated by opening applicable protective devices and disconnecting equipment. The test shall be conducted with all splices, connectors, and terminations in place. The method, voltage, length of time, and other characteristics of the test for initial installation shall be in accordance with NEMA WC 7 or NEMA WC 8 for the particular type of cable installed, except that 28 kV and 35 kV insulation test voltages shall be in accordance with either AEIC CS5 or AEIC CS6 as applicable, and shall not exceed the recommendations of IEEE Std 404 for cable joints and IEEE Std 48 for cable terminations unless the cable and accessory manufacturers indicate higher voltages are acceptable for testing. Should any cable fail due to a weakness of conductor insulation or due to defects or injuries incidental to the installation or because of improper installation of cable, cable joints, terminations, or other connections, the Contractor shall make necessary repairs or replace cables as directed. Repaired or replaced cables shall be retested.

3.10.5 Low-Voltage Cable Test

Low-voltage cable, complete with splices, shall be tested for insulation resistance after the cables are installed, in their final configuration, ready for connection to the equipment, and prior to energization. The test voltage shall be 500 volts dc, applied for one minute between each conductor and ground and between all possible combinations conductors in the same trench, duct, or cable, with all other conductors in the same trench, duct, or conduit. The minimum value of insulation shall be:

$$R \text{ in megohms} = (\text{rated voltage in kV} + 1) \times 1000 / (\text{length of cable in feet})$$

Each cable failing this test shall be repaired or replaced. The repaired cable shall be retested until failures have been eliminated.

3.10.6 Liquid-Filled Transformer Tests

The following field tests shall be performed on all liquid-filled transformers. Pass-fail criteria shall be in accordance with transformer manufacturer's specifications.

- a. Insulation resistance test phase-to-ground.
- b. Turns ratio test.
- c. Correct phase sequence.
- d. Correct operation of tap changer.

3.10.7 Pre-Energization Services

Calibration, testing, adjustment, and placing into service of the installation shall be accomplished by a manufacturer's product field service engineer or independent testing company with a minimum of 2 years of current product experience. The following services shall be performed on the equipment listed below. These services shall be performed subsequent to testing but prior to the initial energization. The equipment shall be inspected to ensure that installation is in compliance with the recommendations of the manufacturer and as shown on the detail drawings. Terminations of conductors at major equipment shall be inspected to ensure the adequacy of connections. Bare and insulated conductors between such terminations shall be inspected to detect possible damage during installation. If factory tests were not performed on completed assemblies, tests shall be performed after the installation of completed assemblies. Components shall be inspected for damage caused during installation or shipment to ensure packaging materials have been removed. Components capable of being both manually and electrically operated shall be operated manually prior to the first electrical operation. Components capable of being calibrated, adjusted, and tested shall be calibrated, adjusted, and tested in accordance with the instructions of the equipment manufacturer. Items for which such services shall be provided, but are not limited to, are the following:

- a. Pad-mounted transformers

- b. Metal-enclosed switchgear

3.10.8 Operating Tests

After the installation is completed, and at such times as the Contracting Officer may direct, the Contractor shall conduct operating tests for approval. The equipment shall be demonstrated to operate in accordance with the requirements herein. An operating test report shall be submitted in accordance with paragraph SUBMITTALS.

3.11 MANUFACTURER'S FIELD SERVICE

3.11.1 Onsite Training

The Contractor shall conduct a training course for the operating staff as designated by the Contracting Officer. The training period shall consist of a total of 8 hours of normal working time and shall start after the system is functionally completed but prior to final acceptance tests. The course instruction shall cover pertinent points involved in operating, starting, stopping, and servicing the equipment, as well as all major elements of the operation and maintenance manuals. Additionally, the course instructions shall demonstrate all routine maintenance operations. A VHS format video tape of the entire training session shall be submitted.

3.11.2 Installation Engineer

After delivery of the equipment, the Contractor shall furnish one or more field engineers, regularly employed by the equipment manufacturer to supervise the installation of the equipment, assist in the performance of the onsite tests, initial operation, and instruct personnel as to the operational and maintenance features of the equipment.

3.12 ACCEPTANCE

Final acceptance of the facility will not be given until the Contractor has successfully completed all tests and after all defects in installation, material or operation have been corrected.

-- End of Section --